March 1952

RAILWAY

TRACK and STRUCTURES

ON TIME! CHECK IT!

Tight schedules require dependable track...

joint bolts stay tighter longer with RELIANCE

HY-CROME *spring washers*

RAILROADS DEPEND on perfection in many details to keep the trains running on time. Not the least of these is keeping track joints tight. Reliance spring washers are designed to do this job and do it well. Control of development and research, manufacture and servicing by experienced personnel help produce and distribute a Hy-Crome product that has been privileged to serve the American Railroads for many years. Their confidence is appreciated.

To those roads we do not serve, we would like the opportunity to send one of our railway fastening engineers to give you more details. Write today.

"Edgemark of Quality"

EATON MANUFACTURING COMPANY, RELIANCE DIVISION

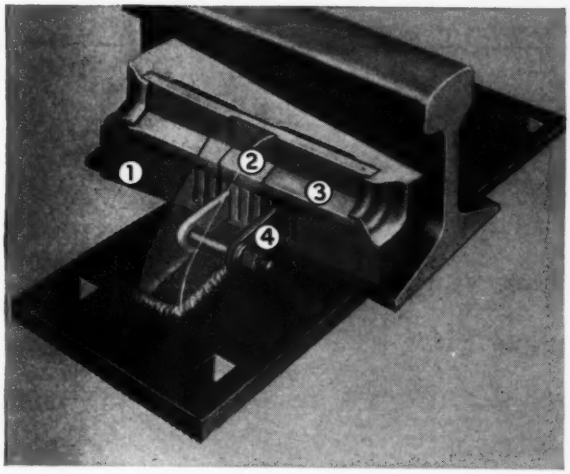
OFFICE AND PLANTS • MASSILLON, OHIO

SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS

It's Your Assurance of Proper Gage Maintenance

This simple, easily-installed rail brace is a source of protection in several different ways. It easily absorbs the jolts and wallops of side thrust. When locked, it cannot loosen up, no matter how great the track vibration. What's more, it provides a positive method of maintaining proper gage. The drawing below will show you why.

Note that a slotted wedge (1) fits snugly between the rail web, rail base, and the bracing



part (2). This wedge can be driven into place with a spike maul or hammer. An integral spring steel member (3), which withstands a compression force of at least 20,000 lb, adds to the tightness of the fit. With the wedge in position to assure proper gage, locking pawls (4) are turned down into the slots. It is therefore impossible for the wedge to loosen or work its way out.

When gage adjustments are needed, the two locking pawls can quickly and easily be pried from the slots; then a blow with a hammer will advance the wedge to the point required. The pawls should then be turned down again into new slots. These slots, by the way, are spaced to permit gage adjustments of 1/16 in.

Bethlehem 811 Rail Brace

Bethlehem's 811 Rail Brace complies fully with A.R.E.A. standards. You can install them with confidence. Thousands are in use by leading

roads throughout the country. Ask a Bethlehem man to show you some in service.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, one year $2.00 (special rate to railroad employees only, one year $1.00). Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 49, No. 3.

USE TEXACO 904 GREASE in your Curve Rail Lubricators

GAIN THESE BENEFITS

- ★★Reduced curve resistance
- ★★Increased rail life
- ★★Reduced wheel flange wear
- ★★Increased wheel life
- ★★Higher tonnage ratings

Texaco pioneered in the development of graphite grease for this service and has consistently maintained the superiority of its product. That is why —

More curved rail is lubricated with Texaco 904 Grease than with all other brands combined.

TEXACO MAINTENANCE OF WAY STANDARDS

TEXACO ENGINEERS have *streamlined* lubrication recommendation charts covering a wide range of equipment. These will help you ... reduce inventory ... increase efficiency ... assure use of correct lubricant.

Texaco Railroad Lubricants and Systematic Engineering Service are available in all 48 States. Just call the nearest Railway Sales Department office in New York, Chicago, San Francisco, St. Paul, St. Louis or Atlanta. Or write:

The Texas Company, Railway Sales Department, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Railroad Lubricants

AND SYSTEMATIC ENGINEERING SERVICE

IN ALL 48 STATES

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE, on television Tuesday nights. METROPOLITAN OPERA radio broadcasts Saturday afternoons.

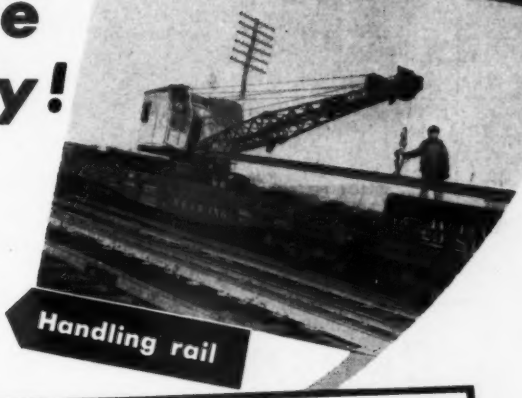
When the going is wet

Handling the Tricky Jobs More Easily!

Driving piles

Just the ordinary job

Setting steel



Handling rail

● Any good machine can do the ordinary jobs but Northwest equipment has demonstrated its adaptability to the unusual problems.

There's a lot of railroad work that is ordinary but you never know just what you're going to meet out on the Line. When you have the stamina, versatility and ability to meet the unusual problems a little better, a little faster, a little more smoothly, then you are really ahead. That is what Northwest advantages bring you.

Your Northwest does jobs no track type machine can handle. It goes anywhere on the line, or off. Put it over the highway on a standard trailer. Load it under its own power on a standard flatcar. Travel from car to car. Equip it for the job—clamshell, magnet, piledriver, tie grapple—any type of handling equipment. Convert it to Shovel, Crane, Dragline, Pullshovel to meet your requirements—and remember, you have the "Feather-Touch" Clutch Control, Cushion Clutch, Uniform Pressure Swing Clutches and many other advantages that make the Northwest a better railroad man's machine.

Plan now to have a Northwest! Ask for details and talk it over with a Northwest man.

NORTHWEST ENGINEERING COMPANY

1513 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL

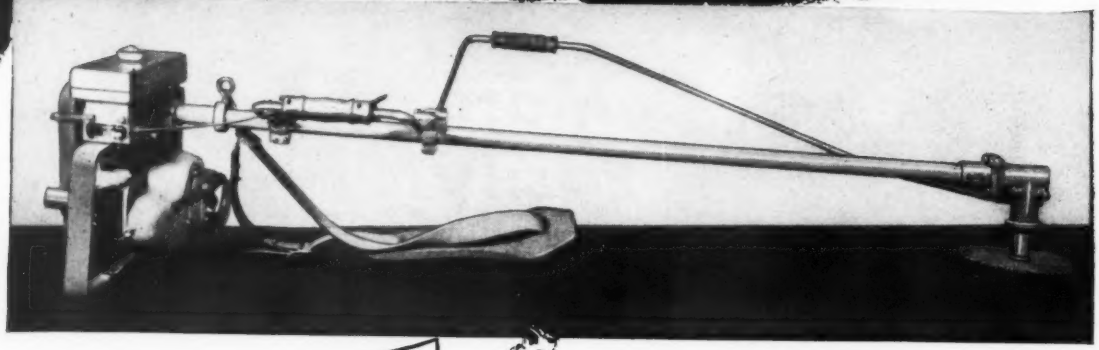
BRUSHMASTER®

CUTS COSTS!

BRUSHCUTTING MACHINE HAILED BY INDUSTRY!

"According to my calculations, the two BRUSHMASTERS would pay for themselves in twenty-nine (29) working days."

SOUTHERN CANADA POWER CO.



BRUSHMASTER

DIRECT FACTORY DEALERSHIPS AVAILABLE!

- **Choice territories now open**
- **Complete, free promotion plan**
- **Free inquiry referral plan.**

Unusual opportunity! Sales of this revolutionary brush cutter practically assured by the complete sales promotion plan!

WRITE TODAY on your own letterhead for complete details of procuring a valuable Brushmaster Factory Dealership!

ONE MAN WITH BRUSHMASTER CLEARS BRUSH Cheaper, Faster Than 6 Hand Cutters

- **Lightweight (35 lbs.) . . . easily operated!**
- **Designed by arboriculture and forestry experts!**
- **Clears all undergrowth . . . even saplings to 4" diameter!**
- **Dependable, rugged . . . free from vibration!**

This amazing new commercial brushcutting machine is the ONE LOGICAL METHOD of maintaining right-of-way clearance! Brambles, vines, bush, brush, briars . . . all undergrowth is quickly, easily, safely cleared by Brushmaster . . . and AT LESS COST! Exhaustively field tested under grueling conditions, Brushmaster is now hailed by hundreds of enthusiastic users!

Manufactured and sold in Canada by
H. & R. Arms Co., Ltd., Drummondville, Quebec

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Subsidiary of HARRINGTON & RICHARDSON ARMS CO.

ESTABLISHED 1871

WRITE TO: 290B WEST ST., KEENE, N. H.

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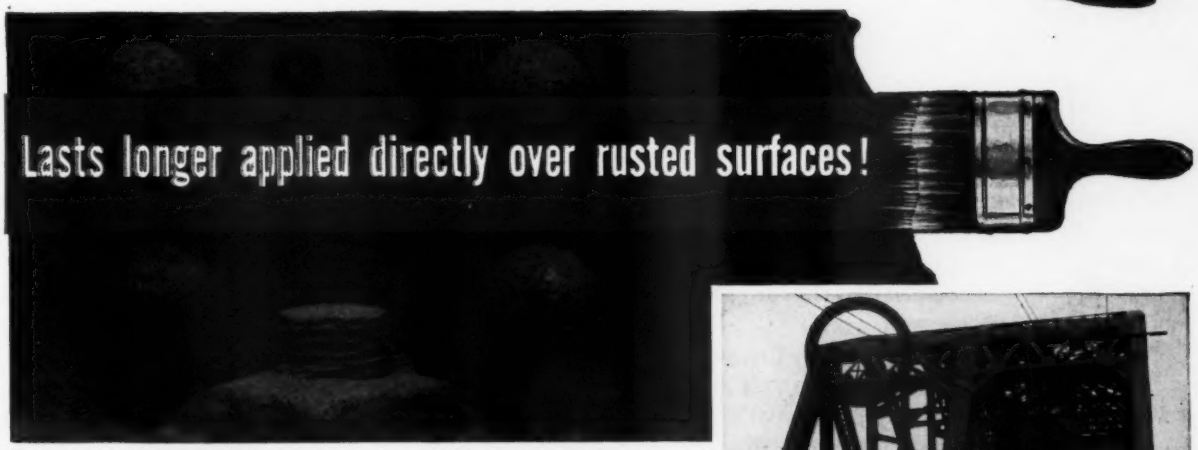
STOPS RUST!

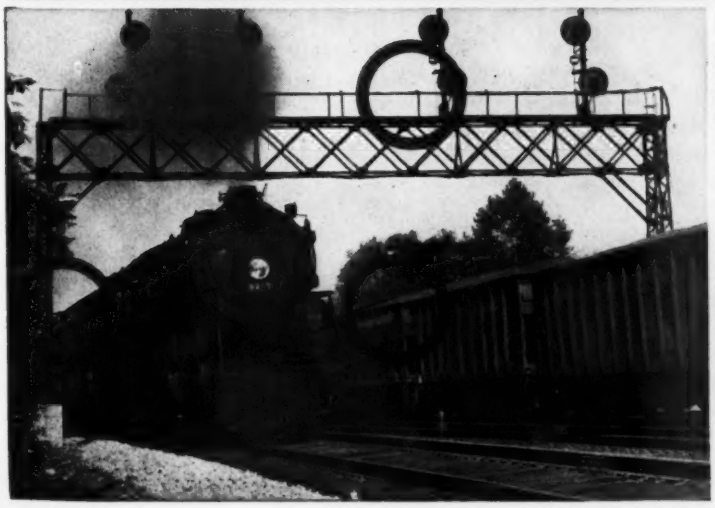
Cut Your Maintenance Costs On Signalling Equipment, Rolling Stock, Bridges, Towers, Tanks, etc.

Here's the *practical, sensible* answer to your rust problems! Costly sandblasting or chemical precleaning are not usually required . . . just wirebrush and scrape to remove rust scale and loose particles . . . then apply RUST-OLEUM by brush, dip, or spray over the rusted surface. Dries to a tough, elastic, rust-resisting film that lasts longer applied over rusted areas. So easy to use that one man often does the work of two . . . saves you time, labor, and money. Get the complete story from your RUST-OLEUM Rust Preventive Railroad Specialist today!

RUST-OLEUM CORPORATION
2547 Oakton Street, Evanston, Ill.

Available In All Colors, Aluminum and White





Request Your FREE Copy of The RUST-OLEUM Railroad Catalog Now!

Now!

GENERAL CHEMICAL'S

Rite-o-way* BRAND

TCA-CHLORATE

★ Outstanding for Control of Perennial Weeds and Grasses!

★ Especially Effective for Early Spring and Late Fall Applications!

GENERAL CHEMICAL WEED CONTROL

Recent AREA† tests have shown a formulation of Sodium Trichloroacetate and Sodium Chlorate to be an outstanding multi-purpose weed killer, particularly where perennial grasses are a problem. Most effective results were obtained when used for early spring and late fall applications.

General Chemical, long a leader in railroad weed control, is now producing "Rite-o-way" Brand TCA-CHLORATE especially for railroad use. It contains a *special, high-strength* formulation of Sodium Trichloroacetate and Sodium Chlorate. When applied in pre-frost and post-frost months, it provides maximum root control for perennial weeds and grasses.

Let us tell you more about General's "Rite-o-way" Brand TCA-CHLORATE formulation . . . and about the results that General Chemical's proven weed control program has achieved for leading roads. A confidential conference with a General Chemical weed control specialist will show you how to take full advantage of General's "customized" weed control program for 1953. For further information, write to the address below.

†See AREA Bulletin Vol. 54, No. 507-Feb., 1953

*General Chemical Trade-Mark

Weed Killer Department

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Following are General Chemical's Rite-o-way Brand Weed Killers. One or more of these can provide the right combination to give outstanding weed control results for your road. Investigate today!

TCA-CHLORATE
Special High Strength Formulation

Contains a special high-strength formulation of sodium trichloroacetate and sodium chlorate, now widely recognized as the outstanding all-purpose weed control material. Provides maximum root control for perennial weeds and grasses. Most effective when applied in post-frost and pre-frost months (early spring and late fall). Mid-summer treatments may be used for control of annual growth and perennial seedlings.

FORMULA 7
(TCA, Acid in an Oil Base)

For general purpose grass control. Used with diluting oil and one of the additives listed for over-all control of weeds.

FORMULA 7
(with 2,4-D)

Combines maximum contact "knock-down" of heavy foliage and residual control of root crowns, providing long-lasting suppression of regrowth. Used with diluting oil where grasses predominate, but includes sufficient 2,4-D to control moderate infestations of broad-leafed weeds.

FORMULA 7 B-D

Used with diluting oil for control of very resistant weeds and grasses. The amount of 2,4-D has been increased and fortified by pentachlorophenol.

SODIUM TCA
(Liquid Concentrate)

For control of noxious grasses. For all-purpose weed control when used with sodium chlorate or one of the 2,4-D additives listed.

EMULSIBLE AROMATIC OIL

Low cost contact weed control for temporary clearance of seedling growth and as interim treatment between seasonal applications for perennial root control.

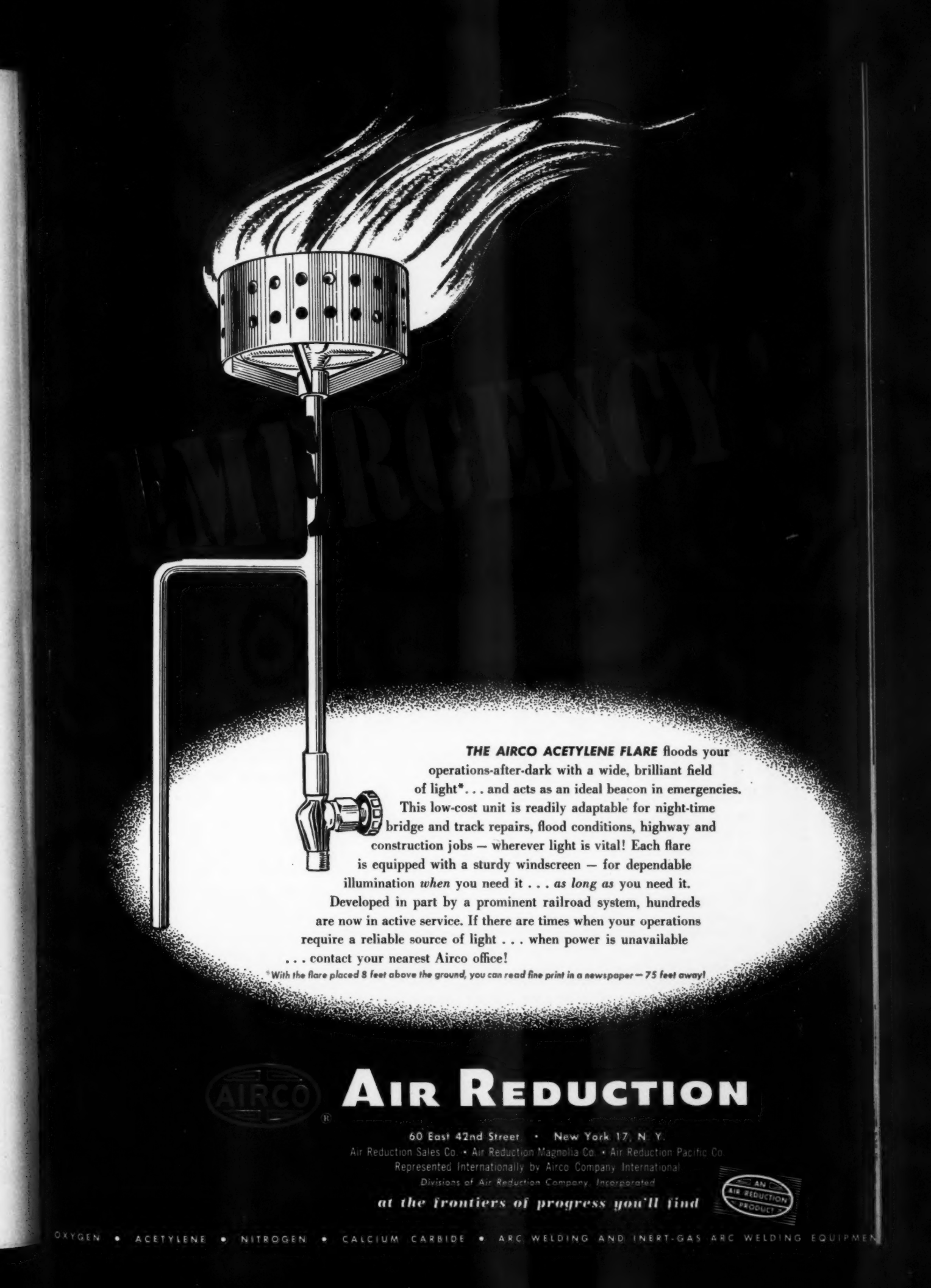
2,4-D AMINE ADDITIVE

Used simultaneously with Formula 7 or mixed with Sodium TCA for all-purpose weed and grass control.

2,4-D ESTER ADDITIVE

For use with Formula 7 where cotton or other plants susceptible to 2,4-D are not adjacent to treated area.

2,4-D—2,4,5-T ESTER
Brush Killer (Water Soluble)



THE AIRCO ACETYLENE FLARE floods your operations-after-dark with a wide, brilliant field of light*... and acts as an ideal beacon in emergencies. This low-cost unit is readily adaptable for night-time bridge and track repairs, flood conditions, highway and construction jobs — wherever light is vital! Each flare is equipped with a sturdy windscreen — for dependable illumination *when* you need it . . . *as long as* you need it. Developed in part by a prominent railroad system, hundreds are now in active service. If there are times when your operations require a reliable source of light . . . when power is unavailable . . . contact your nearest Airco office!

**With the flare placed 8 feet above the ground, you can read fine print in a newspaper — 75 feet away!*

AIRCO®

AIR REDUCTION

60 East 42nd Street • New York 17, N. Y.

Air Reduction Sales Co. • Air Reduction Magnolia Co. • Air Reduction Pacific Co.

Represented Internationally by Airco Company International

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AN AIR REDUCTION PRODUCT

OXYGEN • ACETYLENE • NITROGEN • CALCIUM CARBIDE • ARC WELDING AND INERT-GAS ARC WELDING EQUIPMENT

more work capacity FOR YOUR WORK TRAINS

On work-train operation, Koehring ¾-yard 304 has plenty of weight-stability . . . holds solidly to flat car while excavating below grade. Behind its powerful digging crowd and fast swing are many heavy-duty features that help you get more work done. For instance . . .

There's the Koehring 304 booster clutch that requires only ⅓ to ½ the lever pull of a straight manual clutch . . . yet, retains accurate "feel" of load. Clutch has a heat-compensator spring that makes all tension changes automatically. On the single, continuous chain crowd, there's automatic take-up and release of chain tension that gives you maximum dig-in power at every boom angle. Instantaneous dipper-trip that works every time is just another one of many Koehring features that step up shovel cycles, and give you more production every shift.

As a heavy-duty hoe, this versatile ¾-yard 304 digs 19 ft.-9 in. deep. As a lift crane it has 25-ton capacity on rubber or 13.9-ton capacity on crawler mounting . . . readily converts to magnet crane, pile driver, clamshell, dragline. With any attachment . . . working on or off flat-car, around yards or along the line . . . you can expect a definite increase in work capacity with heavy-duty 304. Other Koehring excavators: ½ to 2½-yards . . . cranes: up to 79½-tons.

← ***Get the complete 304 story in the new 36-page catalog.***

K376RTS

Write for KOEHRING CO., Milwaukee 16, Wis.

NAME

TITLE

COMPANY

KOEHRING

EXCAVATORS CRANES

KOEHRING HEAVY DUTY

RAILAIRS MUD-JACKS®

MORE THAN 50 AMERICAN RAILWAY SYSTEM

have chosen

JACKSON MULTIPLES

THE ONLY MACHINE THAT TA

THE LOAD BEARING ZONE DIRECTLY BENEATH THE RAIL

as the BEST, MOST ECONOMICAL means of producing the SMOOTHEST, LONGEST-LASTING TRA(it is possible to achieve!

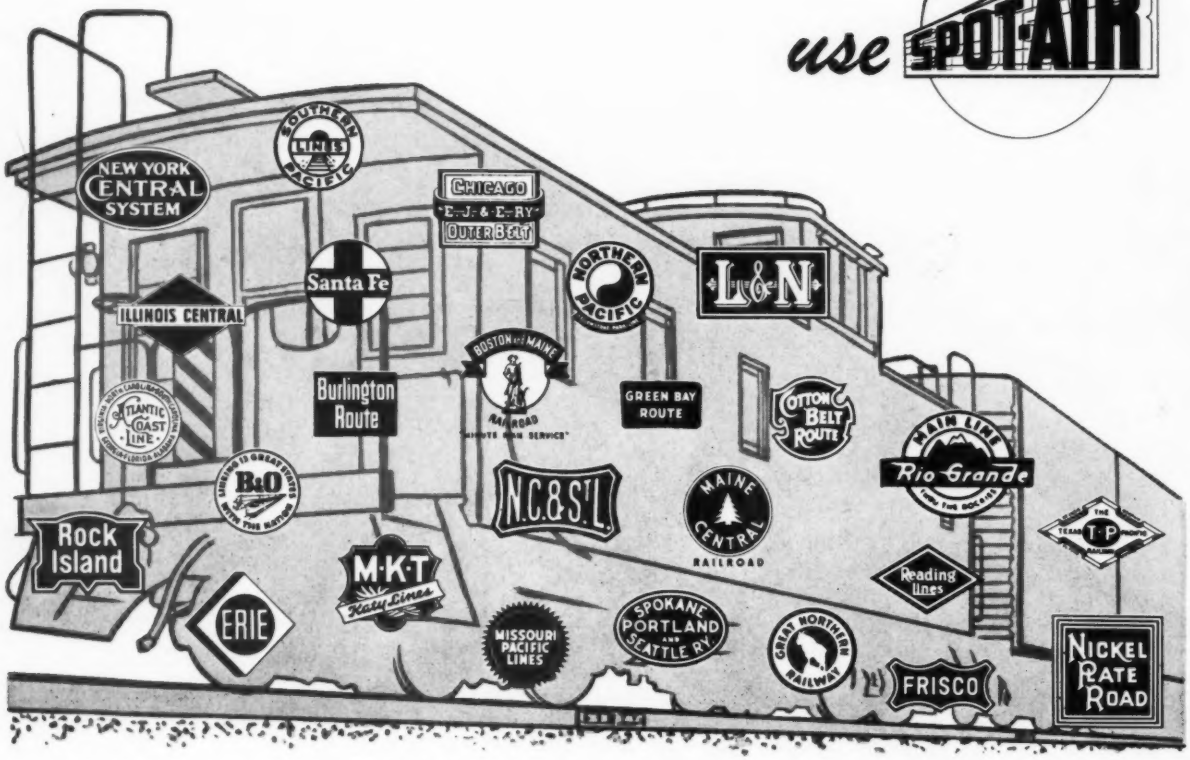
And the fact that a large percentage of these leading railroads have repeated their purchases again and again, with some now operating 10, 12, 16 and as many as 32 JACKSON MULTIPLES each, demonstrates that in actual operation the machine fully confirms the wisdom of such a choice.

We would be happy to have one of our thoroughly experienced track engineers, who knows and understands your problems, discuss with you the ways in which the JACKSON MULTIPLE Tamper can help you achieve finest track and cut maintenance costs to the bone. Write, wire or phone.

MFD. BY JACKSO VIBRATO INC. LUDINGTON, M

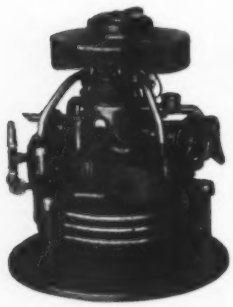
SOLD in U. S. A. by **ELECTRIC TAMPER & EQUIPMENT CO.**
LUDINGTON, MICHIGAN

These leading railroads use SPOT-AIR



for....

- TIE TAMPING
- WOOD BORING
- SPIKE DRIVING
- PAINT SPRAYING
- BOLT TIGHTENING
- ROCK DRILLING
- CONCRETE BREAKING



Type 3R-36
Weight: 265 pounds
32 inches high
27 inches wide

A coast-to-coast network of the country's leading railroads now depends on the SPOT-AIR compressor to furnish air power for their section gangs. It can easily handle four Ingersoll-Rand MT-4 tie tampers or a wide range of I-R air tools for roadbed work, bridge and building, and grade crossing maintenance.

Although the 3R-36 SPOT-AIR stands only 32 inches high on a 27 inch baseplate, it delivers rated 36 cfm of free air at 80 psi. This 265 pound, gasoline-driven compressor is easily transported on its own wheelbarrow mounting or on a section-car.

Your nearest Ingersoll-Rand representative will be glad to give you the full story on the versatile SPOT-AIR compressor and the air tools it operates.

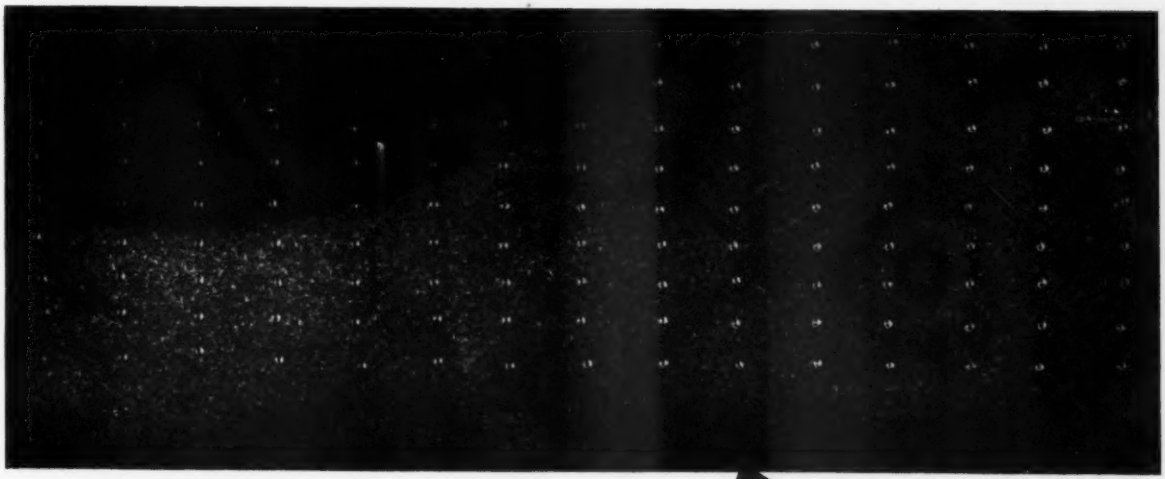
The 3R-36 SPOT-AIR operating four MT-4 tie tampers.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 764-2

CF&I MILL END-HARDENED RAILS...

SHOWING GRADUAL TRANSITION OF HARDNESS



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	363	363	363	363	352	341	321	293	262	255	255	248	255	262	262
2	341	341	341	331	311	293	277	262	255	255	248	255	255	262	262
3	293	311	311	302	285	277	265	255	248	248	255	255	255	262	262
4	269	277	269	265	262	248	248	255	255	255	262	262	262	262	262
5	262	262	255	248	248	248	255	255	255	255	262	262	262	255	262
6	255	262	262	255	255	255	255	255	255	255	262	255	262	262	262
7	255	265	265	262	262	262	262	262	262	255	262	262	262	262	262
8	262	265	265	262	262	265	262	262	262	262	262	262	255	262	262
9	269	269	269	265	265	262	265	265	262	262	262	262	262	262	262

This enlarged view shows the etched pattern with the addition of the Brinell Hardness reading distribution converted from Rockwell "C" impressions.

Readings were made at ¼-inch intervals horizontally, except A, which is ⅛-inch from the rail end. Vertical readings were taken at ⅛-inch intervals below the top surface of the rail head. This discloses the gradual transition zones from hardened to normal rail hardness.

This hardened zone on top of the rail head extends longitudinally a minimum of 1½ inches from the rail end. Metallurgical reports available on request.

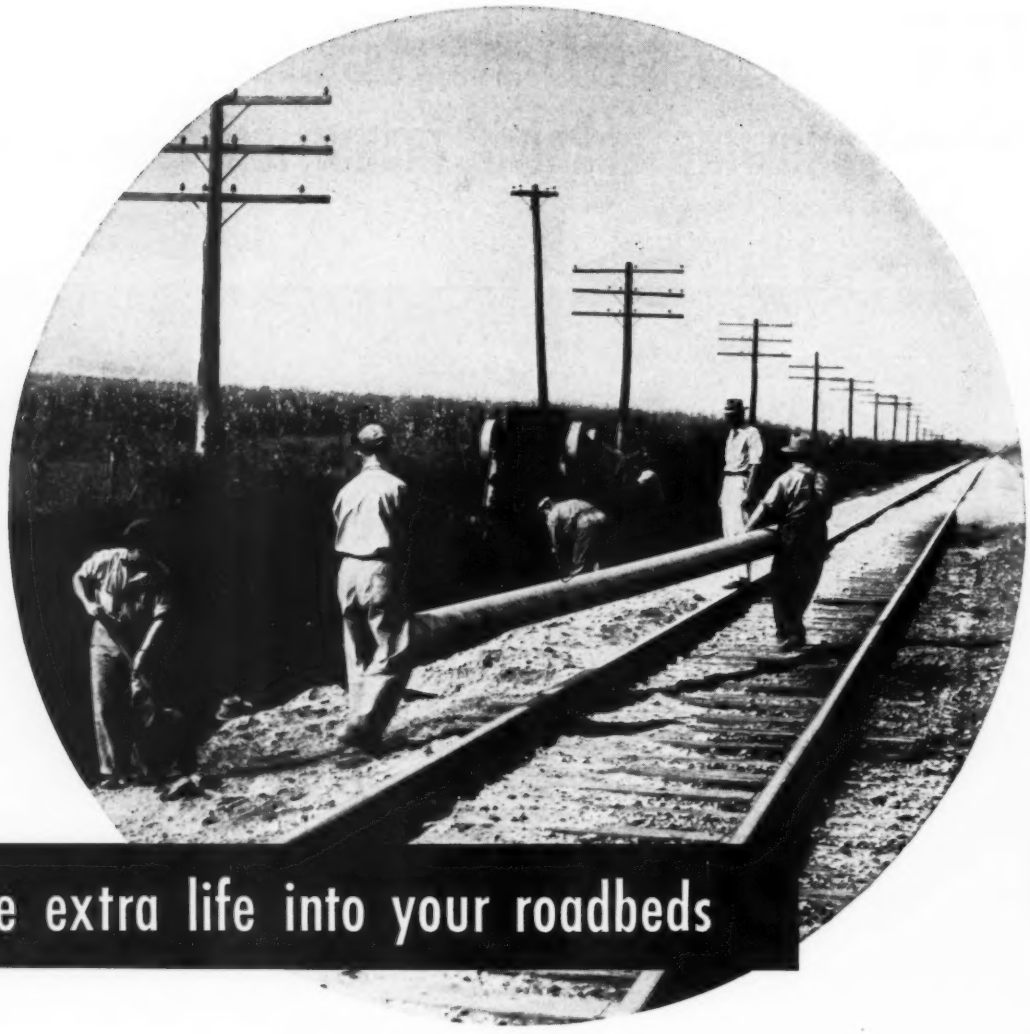
RAILS AND ACCESSORIES

THE COLORADO FUEL AND IRON CORPORATION

DENVER, COLORADO

CF&I

1507



Pipe extra life into your roadbeds

Excess water in the subgrade means weak foundations—often results in "slow orders" and high maintenance expense. Many railroads have put new life into tired, unstable roadbeds by eliminating harmful ground water with Armco Perforated Pipe. It is simple and economical.

An Armco Subdrainage System drains the water out and keeps it out. You are assured continuing trouble-free protection at low cost. Roadbeds stay dry and firm. Maintenance costs go down.

Initial costs are low because Armco Perforated Pipe is easy to handle and install. Unskilled crews quickly lay long, 20-foot lengths and make strong, tight joints with simple bolted couplers. The job goes fast.

Armco Pipe has ample strength. It won't crush, crack or pull apart. There is no danger from frost action, shifting soils or heavy railroad loading. Clogging is no problem.

You'll find Armco Perforated Pipe the dependable, low-cost way to solve the problem of soggy subgrades for years to come. Write for complete information. Armco Drainage & Metal Products, Inc., 2063 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

ARMCO PERFORATED PIPE

ARMCO

PENTA TREATMENT WILL PROTECT YOUR INVESTMENT IN LUMBER

Clean PENTA makes wood last 2 to 4 times longer... cuts repair and replacement costs

The Dow Chemical Company
Dept. PE 3-3B2, Midland, Michigan

Please send me:

_____ Plant wood treating specifications.

_____ Valuable booklet, "Pointers on Penta."

_____ Sources of treated wood.

Name_____

Title_____

Company_____

Address_____

City_____ State_____

It's a matter of record that PENTA* treatment is the sure way to protect your investment in railway lumber. Because PENTA gives positive protection against decay and termites you can be sure that platforms, loading docks and car lumber will last years longer. Longer life for all your wood construction means big savings in repair and replacement costs.

This is only part of the return you will realize from PENTA-treated wood. Besides controlling decay and termites, PENTA builds good customer relations because it is *clean*. Platforms built with PENTA-treated wood are pleasing to the eye, and easy to walk on.

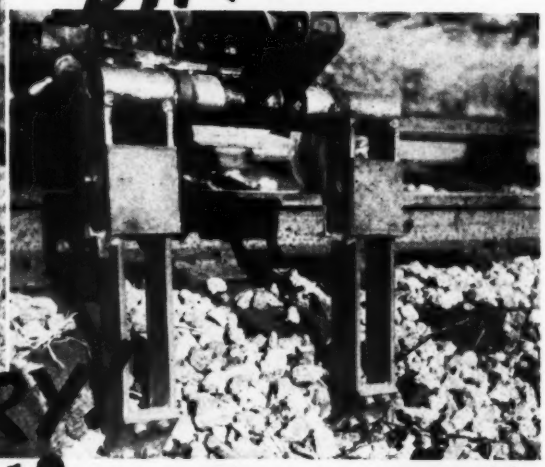
Workmen like *clean* PENTA-treated wood, too, because it is easy to handle.

In your choice of a wood preservative, specify *clean* *PENTAchlorophenol. Send for more detailed information today, write THE DOW CHEMICAL COMPANY, Midland, Michigan.

you can depend on DOW CHEMICALS

DOW

NEW! DIFFERENT,



REVOLUTIONARY

NO OTHER MACHINE LIKE "Jack-all"

THE KERSHAW SELF-PROPELLED HYDRAULIC JACK-TAMPER FOR RE-TIMBERING AND SURFACING

Above, left: Tamping ballast 3" to 6" under tie-ends. Hydraulic tampers adjustable horizontally.
Above, right: Tamping tie-ends completed. Tie-nipping unnecessary.

Kershaw "Jack-All" machine in operation, track has been raised and hydraulic tampers are catching off the tie-ends on each side of jack foot.

You need no fork-or-shovel-men . . . no jack-men . . . no tie-nippers. One Foreman handling the spotboard and one man operating the new Kershaw "Jack-All" machine, do a complete job of pulling the track for re-timbering and surfacing.

SURFACING: A spotboard with telescopic sight permits use of the "Jack-All" with any surfacing gang. The "Jack-All" is particularly adapted for use with multiple tampers, with the tamping head between the wheels. The machine pulls the track and tamps the tie-ends ahead of the tamper sufficiently to hold up the heaviest multiple tamper.

RE-TIMBERING: The "Jack-All" raises the rails off the ties, then the tamper bar starts the old tie from the tie-bed.

The new Kershaw "Jack-All" is completely operated by hydraulic pumps and hydraulic rams. No gears to maintain. It has automatic rail dogs and hydraulic tampers on each side. Weight, approximately 4,000 lbs.; 24 HP 4-cylinder gasoline engine; 2 hydraulic pumps operate at 1,000 PSI. Write or wire for price information.

(Write or phone us for FREE DEMONSTRATION on your own track—no obligation)

KERSHAW MANUFACTURING CO., INC., P. O. BOX 510, MONTGOMERY, ALA.

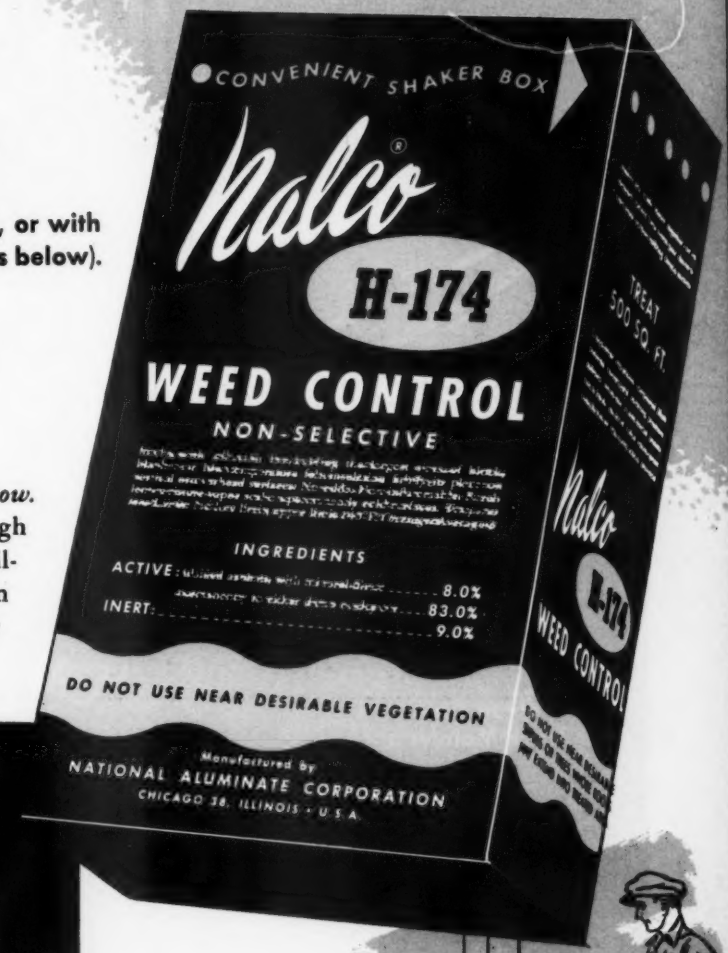
TRACKWORK EQUIPMENT DESIGNED, DEVELOPED AND PROVEN ON THE JOB

Nalco® H-174

NON-SELECTIVE WEED and BRUSH CONTROL

- **NEW GRANULAR FORM eliminates drift; assures free flow.**
- **HIGH ACTIVITY guarantees thorough kill; stays active for months to stop regrowth.**
- **EASY APPLICATION with new shaker box, or with hand or wheeled spreader (see illustrations below).**
- **NO MIXING with liquids necessary; use H-174 as it comes from box or drum.**
- **MAY be safely applied by hand.**

BEST time for Nalco H-174 application is *now*. Pre-emergence killing action continues through the growing season with this powerful soil-sterilant-type chemical. Full information on Nalco H-174 will be furnished promptly upon request.



Wheeled power spreader puts adjustable Nalco H-174 dosage down accurately over widths from 5 to 15 feet. Fast and easy to use. Available from Nalco.

Hand-operated spreader for Nalco H-174 makes for convenient one-man operation; assures even dosage. Spreader available from Nalco.

New 3½-lb. shaker box permits Nalco H-174 application to localized areas for better, more economical weed and brush control.

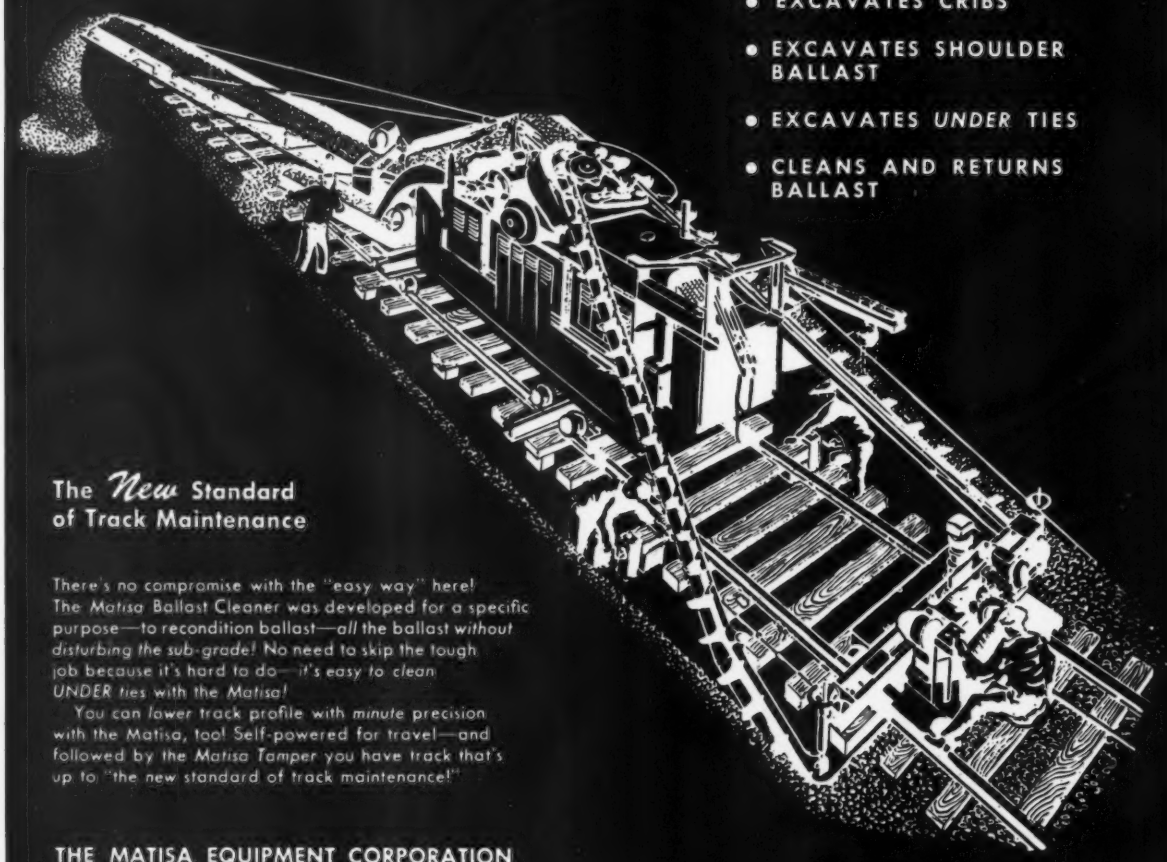
NATIONAL ALUMINATE CORPORATION
6196 West 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to: Alchem Limited, Burlington, Ont.

A Nalco PRODUCT . . . Serving Railroads through Practical Applied Science

ONE Matisa DOES ALL FOUR

in ONE operation!

- EXCAVATES CRIBS
- EXCAVATES SHOULDER BALLAST
- EXCAVATES *UNDER* TIES
- CLEANS AND RETURNS BALLAST



The *New* Standard of Track Maintenance

There's no compromise with the "easy way" here! The *Matisa* Ballast Cleaner was developed for a specific purpose—to recondition ballast—*all* the ballast *without disturbing the sub-grade!* No need to skip the tough job because it's hard to do—*it's easy to clean UNDER ties with the Matisa!*

You can *lower* track profile with *minute* precision with the Matisa, too! Self-powered for travel—and followed by the *Matisa Tamper* you have track that's up to "the *new* standard of track maintenance!"

THE MATISA EQUIPMENT CORPORATION
224 South Michigan Blvd. • Chicago 4, Illinois

TRACKWORK SPECIALISTS ALL OVER THE WORLD

Matisa

NEWS NOTES...

MARCH 1953

...a resumé of current events throughout the railroad world

More than $20.9 million will be spent by the Union Pacific this year on its rail and ballasting program. This will include laying rail on about 624 miles and ballasting more than 430 miles of track with crushed rock. New 133-lb. rail will be laid on 401 miles and second-hand rail on the remaining 223 miles of track.

•

For providing around-the-clock elevator service for the office personnel at its Chicago terminal offices in Grand Central station, the Baltimore & Ohio replaced two manually-operated elevators with two Otis automatic elevators of the new electronically-controlled type which can handle traffic without attendants. A supervisory system, incorporating electronic circuits, automatically coordinates both cars for uniform service.

•

A ton-mile tax on heavy motor trucks and commercial vehicals is proposed in a bill introduced in the Connecticuit legislature. Ton-mile or weight-distance taxes are also reported to be under consideration in a number of other states among them California, Montana, New Jersey and Ohio.

•

Citizens of Rockville Center, N.Y., wanted an escalator so badly to ease their 22-ft. climb in the Long Island's station that they had a special act passed by the New York legislature giving the village an easement on the railroad property to make it legal for the village to pay for it.

•

A Safety First calendar, complete with information on how to utilize different units of the company's safety equipment, was mailed with a personal message from President C. M. Roddewig to the wife or mother of each employee of the Chicago & Eastern Illinois with the hope of adding impact from the distaff side.

•

President Eisenhower has directed that the Consumer's Price Index, to which the escalator-clause provisions in railroad wage agreements are tied, be compiled under the "old series" for another six months by the Bureau of Labor Statistics, instead of the new one of last month, to allow time for the adjustment of wage contracts to the new index.

•

Railroad employment in December 1952 decreased 1.93 per cent under the same month of the previous year, according to preliminary figures issued by the Interstate Commerce Commission. There were decreases in five groups, ranging from 4.82 per cent, for the group embracing transportation employees other than those in train, engine and yard service, to 0.57 per cent for the professional, clerical and general group. However, the group embracing executives, officials and staff assistants showed an increase of 1.39 per cent, and the maintenance of way and structures group an increase of 0.06 per cent.

NEWS NOTES (continued)

A firm of materials-handling engineers has been employed by the Erie to make a survey of the road's existing facilities with the object of reducing the time and cost of handling l.c.l. freight.

•

In 1952, Class I railroads put 2,415 new locomotives, or 3,065 units, in service. Of this number, 2,389 (3,038 units) were diesels, 19 steam, 1 electric, and 6 gas-turbine locomotives.

•

Statistical figures for the year 1952, show that it was the safest year on record for railway travel. About 10 per cent fewer persons were killed and injured as compared with the previous year.

•

Net operating income for Class I railroads in 1952 ($1,078 million) was up about 14.5 per cent as compared with 1951 ($941 million), and, produced a return of 4.11 per cent on the property investment as compared with 3.69 per cent in 1951.

•

According to the latest statement issued by the ICC's Bureau of Valuation on the value of property used by Class I line-haul railroads, the cost of reproduction new, except for land and rights, is $46.6 billion, of which $33 billion is for road and $13.5 billion for equipment. As of January 1, 1952, the "present" value of land and rights is put at about $2 billion, and working capital at about $1 billion.

•

Pennsylvania's new passenger station and freighthouse at Alliance, Ohio, was dedicated on February 23rd by city officials, chamber of commerce officers, representatives of Mt. Union college and the railroad. These facilities replace an old station built in 1866 which will be torn down.

•

The time for completing the study being made by the Interstate Commerce Commission on the organization and operations of that body was extended until June 30 by the Senate. This extension was granted as the Wolf Management Engineering Company filed a report based on a six-month survey of the Interstate Commerce Commission.

•

ALSO WORTH NOTING—William White, president of the New York Central, states that his road contemplates extensive work in bringing its maintenance work up to date through increased mechanization of procedures. . . . Senator Hunt of Wyoming suggests that the Department of Defense use rail transportation to stop "the terrific loss of life" resulting from recent military airplane crashes. . . . A contract has been awarded by the Atchison Topeka & Santa Fe for dismantling its existing station at Lubbock, Texas, and for constructing a new one at that point. . . . Ten congressmen have introduced a total of 14 bills into the legislative hopper for liberalizing benefit provisions of the Railroad Retirement Act. . . . John E. Hansbury, head valuation engineer of the ICC's Bureau of Valuation, has been appointed acting director of the bureau.

This rig keeps the main line clear

The Chicago, Rock Island & Pacific ran into a tough problem on this railroad cut near Hutchinson, Kansas. Ditches had to be opened alongside the cut, but hauling the sand and clay out on railroad cars would tie up a long stretch of main line. So the C.R.I. & P. called in one of its Caterpillar teams—a D6 Diesel Tractor with No. 60 Scraper.

Hauling 7 cu. yds. struck or 9 heaped, this rugged yellow scraper handled two loads an hour, going a tough 1½-mile round trip. And the main line stayed clear for payload traffic.

The No. 60 Scraper is cable-operated for easy control of depth of cut and spread. And positive forced ejection sweeps the smooth-walled scraper bowl clean of the stickiest material. Special high-tensile steels in all highly stressed structural members keep dead weight down and put extra years of service into these durable earthmovers. The push block is located well back of the tires so a push tractor can add plenty of in-line power. And the scraper's low center of gravity and giant low-pressure tires keep it stable on the roughest terrain.

Your Caterpillar Dealer will be glad to demonstrate Cat Scrapers for you. There are 9 sizes, heaped capacities from 4½ to 27 cu. yds. without extensions. And remember, only genuine Caterpillar parts can guarantee you the genuine Caterpillar quality that's built into every one of these big yellow machines.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Clear the Track

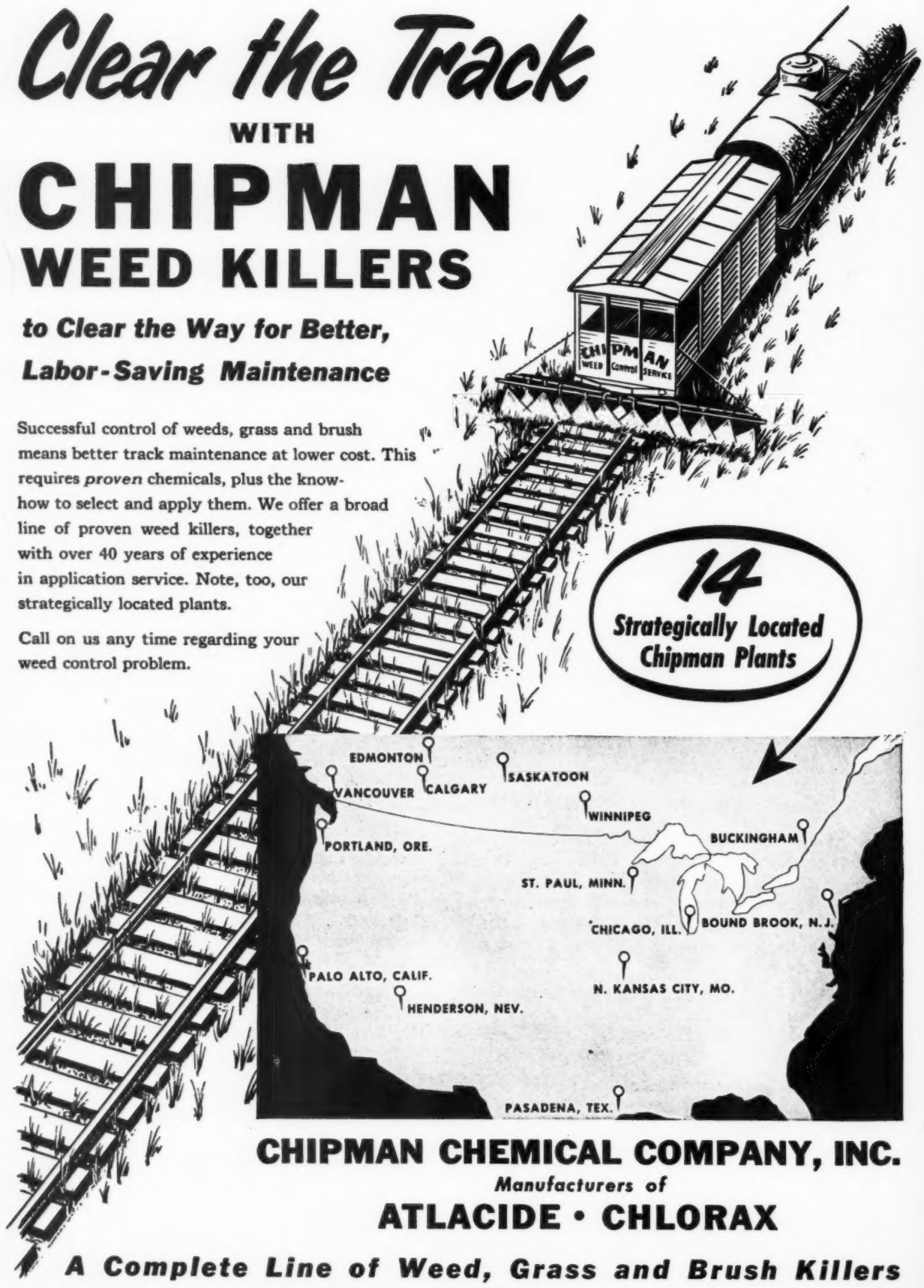
WITH

CHIPMAN
WEED KILLERS

to Clear the Way for Better, Labor-Saving Maintenance

Successful control of weeds, grass and brush means better track maintenance at lower cost. This requires *proven* chemicals, plus the know-how to select and apply them. We offer a broad line of proven weed killers, together with over 40 years of experience in application service. Note, too, our strategically located plants.

Call on us any time regarding your weed control problem.



CHIPMAN CHEMICAL COMPANY, INC.

Manufacturers of

ATLACIDE • CHLORAX

A Complete Line of Weed, Grass and Brush Killers

PLENTY TOUGH

and ready to prove it!

MOSS *Creosoted Black Gum* CROSSINGS

● These Moss Crossings are tough. They're built to take it. Heavy vehicular traffic pounds at them day after day, month after month, year after year, yet many Moss Crossings have been in service fifteen years and more, with very little sign of deterioration. For crossings that are sturdier, more rugged, that render longer service with a minimum of maintenance ... specify Moss Creosoted Black Gum Crossings.

MC
The Stamp of Character

T. J. MOSS TIE COMPANY

700 SECURITY BUILDING • SAINT LOUIS 2, MISSOURI

Cross Ties • Switch Ties • Lumber • Poles and Posts • Piling • Crossings

WOOD PRESERVING PLANTS: Mt. Vernon, Ill.; E. St. Louis, Ill.; Granville, Wis.; Shreveport, La.; Columbus, Miss.

The track ahead of the McWilliams Ballast Distributor after renewal and spacing of ties.

PLACES BALLAST . . . IN ANY QUANTITY... *EXACTLY* WHERE IT IS NEEDED

This important new track maintenance development places ballast in perfect position for tamping . . . both inside and outside of the rail. Operating with a crew of one man, it picks up ballast dumped outside of the tracks and deposits it exactly where it is needed for tamping. The location and quantity of ballast are absolutely controlled.

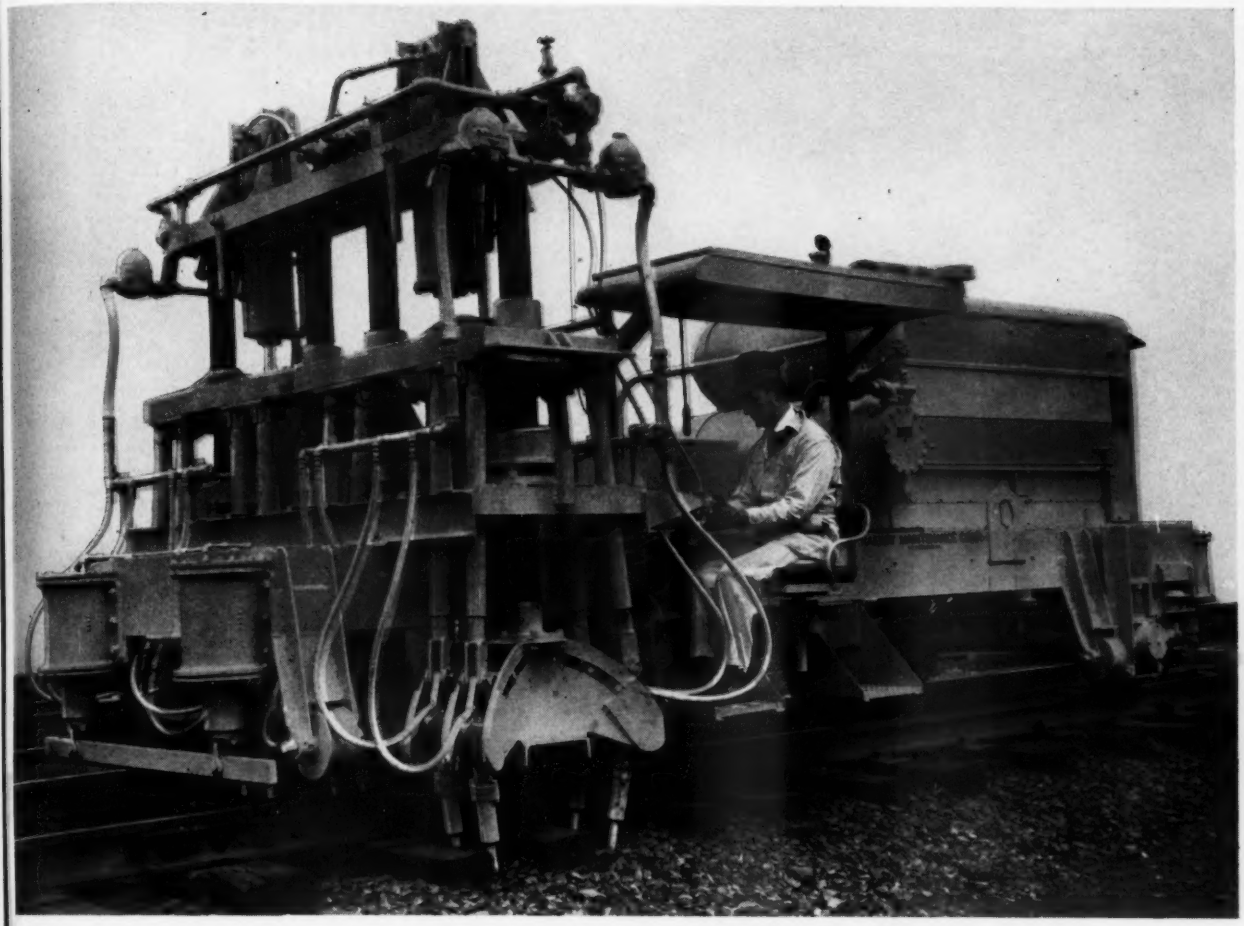
THE *NEW* McWILLIAMS BALLAST DISTRIBUTOR

A GREAT NEW TAMPING TEAM

In service . . . it's saving one railroad $400 per day by replacing 30 men

Although developed as a companion to the McWilliams Tie Tamper, this machine will speed up and improve any mechanical or hand tamping operation. An important cost saving feature is the fact that track always is left clear of new ballast until tie renewal and spacing are completed. The machine follows the tie gang ahead of the tamper. In its first application . . . where it is saving $400 per day for a major Eastern railroad . . . it definitely has proved its ability to distribute ballast faster and more accurately than a crew of 30 men. Using any type of ballast, this machine will distribute it properly for any desired track raise.

Write for details on how the McWilliams Ballast Distributor will improve your tamping operations.



The Service-Proved McWILLIAMS TIE TAMPER

The most versatile . . . most efficient Tie Tamping Machine ever developed

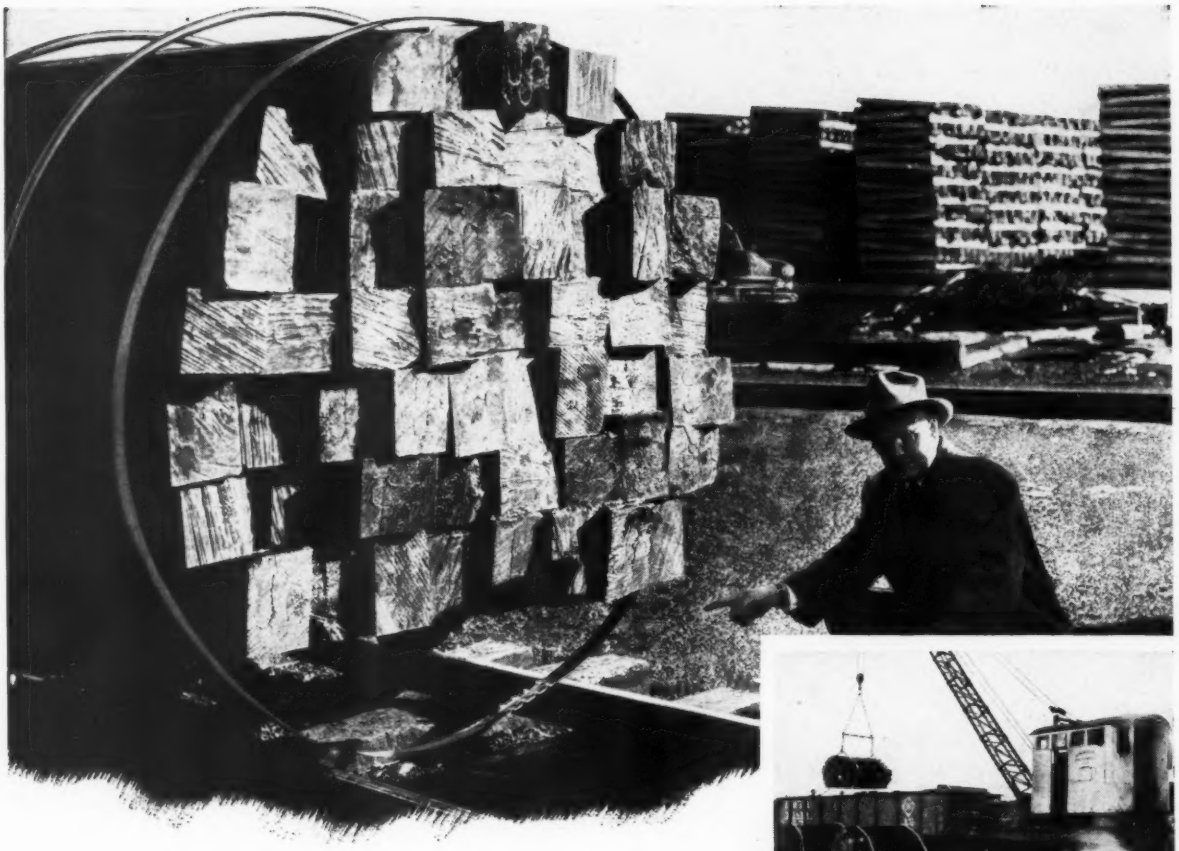
This is the only tamping machine which compacts the ballast firmly *under the rail* . . . with no danger of crushing the ballast. The unique split head design permits tamping of all kinds of ties—crooked ties, slued ties, out-of-line ties. The McWilliams Tie Tamper also can be used for picking up low joints or surfacing where one rail requires more tamping than the other.

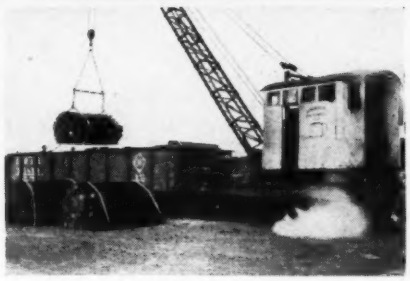
- **The entire weight of the machine is on tamped track, eliminating the necessity for fork tamping and reducing the number of jacks.**
- **Operating rate: 350 to 450 feet per hour of perfectly tamped track**
- **Controlled tool pressure does not crush ballast**
- **Will tamp track raises from ½" on up**
- **The compressor can be used to operate other air equipment**
- **By far the easiest tamper to maintain. All working parts accessible for easy removing and replacing in the field**

Railway Maintenance Corporation

PITTSBURGH 30, PA.

DESIGNERS AND MANUFACTURERS OF: McWILLIAMS MOLE AND SUPER MOLE . . . McWILLIAMS TIE TAMPER, CRIB CLEANER AND BALLAST DISTRIBUTOR . . . R. M. C. RAIL JOINT PACKING



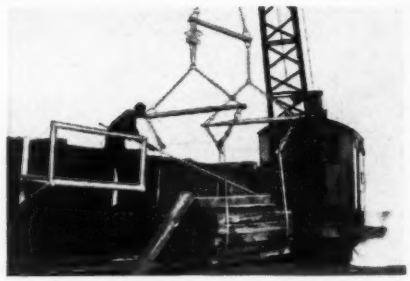


FAST LOADING. Tram loads of ties, strapped with two special bands of Brainard steel strapping, are lifted quickly from ground into gondola with Brainard method.*

Get the facts on efficient tie handling

MEET Jim Rolando . . . a believer in *on-the-job* demonstration . . . who is now servicing Brainard's new system of tie handling. Jim and experienced Brainard engineers are ready to study your tie-handling operations, make recommendations, and show you the labor savings realized with this system.

For the full story call your local Brainard salesman. District offices located throughout the U. S.



FAST DISTRIBUTION. Man on catwalk drops ties one at a time from moving car. Ties drop parallel to track. Plans for the patented lift* are available free of charge to railroads and tie-treating plants for production in their own shops.

*Patent No. 2,622,540

For booklet write Brainard Steel Division, Sharon Steel Corp., Dept. HH-3, Griswold Street, Warren, Ohio.

Brainard

SHARONSTEEL

STEEL DIVISION
SHARON STEEL CORPORATION

WARREN, OHIO

Complete
BRUSH and WEED KILLING SERVICE

PIONEER in the improved right-of-way brush control

Spraying equipment specifically designed and proven for the purpose

LEADER in effective grass and weed killing control

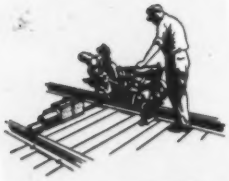
Service For Your Railroad

• TCA • OILS • 2, 4-D
• PENTACHLOROPHENOL
• BRUSH KILLERS

Spray Services Incorporated

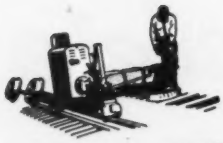
Pioneers in Right-of-Way Spraying
P. O. BOX 5444 HUNTINGTON, W. VA.

POWER JACK . . . Maintains alignment while speeding up ballasting and general surfacing operations.

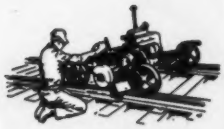


TRACK WRENCH . . . Provides uniformly controlled tightening on track bolts to prolong rail life and make better riding track.

SPIKE PULLER . . . By getting spikes out faster this machine speeds up relaying and reduces the cost of the entire operation.



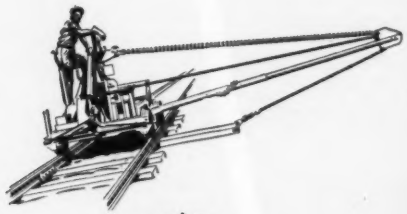
ADZING MACHINE . . . Provides tie seats in keeping with today's track maintenance standards—all level and in same plane.



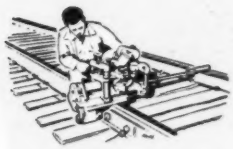
RAIL GRINDERS . . . With four types of grinders, Nordberg can supply the machine best suited to any type of maintenance grinding.

NORDBERG "*Mechanical Muscles*"*

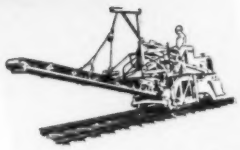
THE MODERN—LOW COST WAY TO MECHANIZED MAINTENANCE



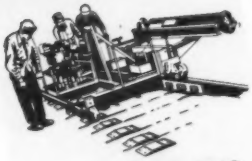
GANDY . . . A triple-purpose machine for removing ties—inserting ties—and as a material handling crane.



RAIL DRILL . . . A compact, lightweight, low-cost easily set drill that proves a money saver.

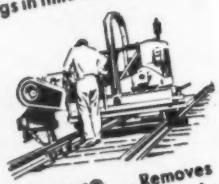


DSL YARD CLEANER . . . Cleans more track faster, better, more economically . . . without damaging ties.

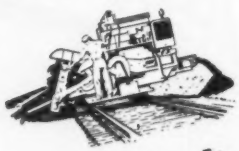


DUN-RITE GAGING MACHINE . . . Nordberg's newest development—for extremely accurate gaging by correctly positioning the tie plates.

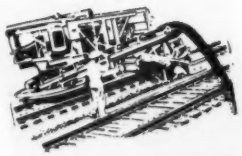
SPIKE HAMMER . . . All spikes driven straight and at big savings in time and money.



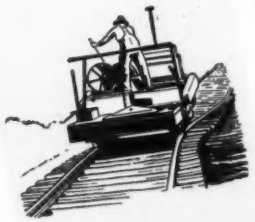
CRIBEX® . . . Removes material contained in the cribs and deposits it beyond the ends of the ties.



BALLASTEX® . . . Excavates the ballast in area between tracks or in shoulder. Disposes of it by wasting or by feeding to SCREENEX for cleaning.



SCREENEX® . . . Takes excavated fouled ballast fed by BALLASTEX, cleans material and returns it to track, intertrack, or shoulder.



TRACK SHIFTER . . . Especially suited to heavy lining and high lifts. For new construction, flood repair and grade or line change work.

Use NORDBERG "*Mechanical Muscles*" to do a Better, Faster Maintenance Job at Lower Cost . .

For full details on any or all of these Nordberg "Mechanical Muscles"* write for Bulletins.

*Copyright Nordberg Mfg. Co. B453

ADZING MACHINE • CRIBEX® • BALLASTEX® • SCREENEX® • GANDY • POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • SPIKE PULLER • TRAKGAGER • TRACK SHIFTER • DSL YARD CLEANER

NORDBERG MFG. CO., *Milwaukee, Wis.*

NORDBERG MACHINERY

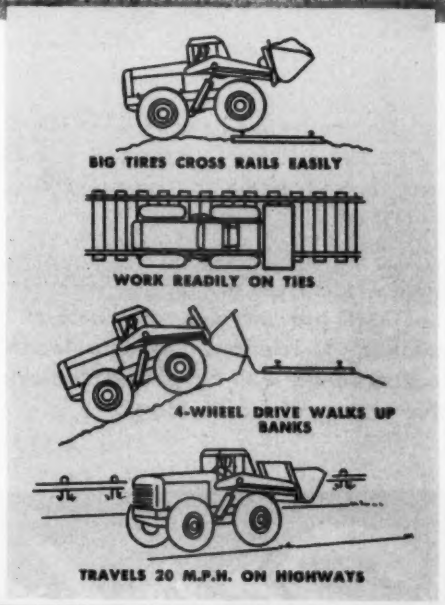
PAYLOADER *WORKS ANYWHERE*

4-WHEEL DRIVE GIVES TRACTION, MOBILITY AND VERSATILITY!

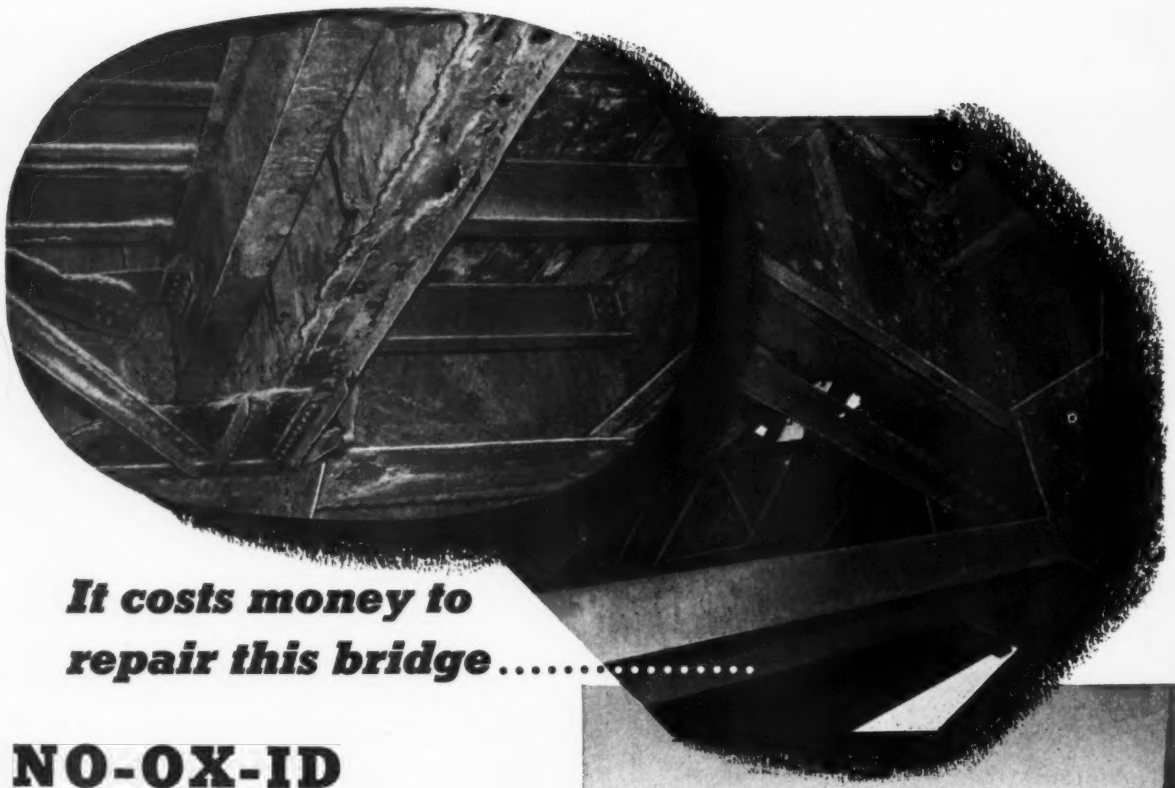
Load! Dig! Backfill! Carry! Spread! Lift! Pull! Push!—all these operations are everyday tasks for the big, versatile "PAYLOADERS"—makes them valuable for right-of-way work, and at terminals, yards and stations.

These "PAYLOADERS" feature large pneumatic tires, 4-wheel-drive, proper weight distribution and power-boosted steer. Other outstanding advantages are full, double-acting hydraulic bucket control and four speeds in *both* directions. They will travel in either direction from a slow, powerful crawl up to 20 miles per hour. Sales *and* service are available from 200 "PAYLOADER" Distributors in the U. S. and Canada. See yours for full details or write The Frank G. Hough Co., 751 Sunnyside Ave., Libertyville, Ill.

CATALOGS are available on any "PAYLOADER": 4-wheel-drive Models HM — 1½ cu. yd. and HR — 1 cu. yd.; rear-wheel drive Models HY — 1¼ yd., HF — ¾ yd., HE — ½ yd.; front-wheel-drive Models HAH — ½ yd., HA — 12 cu. ft.



PAYLOADER®



It costs money to repair this bridge.....

NO-OX-ID *eliminates this metal loss!*

Replacing rust-ruined steel bridge members is expensive . . . it's unnecessary, too! Because you can conserve vital materials and man-hours by preventing corrosion with NO-OX-ID Rust Preventives.

Wherever metal surfaces are exposed—on bridges, water tanks, structures, railroads—wherever steel is used, NO-OX-ID prevents rust with one coat. No expensive re-scaffolding is required. Ask your Dearborn Engineer to recommend the NO-OX-ID combination best suited to solve your corrosion problems.

Send for informative* NO-OX-ID *bulletins

A series of valuable and informative bulletins describing how NO-OX-ID's are used to control corrosion are available to you. Your copies will be mailed promptly on request.

Dearborn

TRADE MARK

DEARBORN CHEMICAL COMPANY
MERCHANDISE MART PLAZA
CHICAGO 54, ILLINOIS

THE ORIGINAL RUST PREVENTIVE

NO-OX-ID

WOODINGS

ADVANCED TYPE RAIL ANCHOR

the Woodings *anti pinch* design provides two *equal* grip jaws, the *wide steel section* reduces the possibility of derailed wheels punching the anchor through the rail base, and the *facet design* allows self-adjustment to the point where four contacts are made—enabling the anchor to *adjust itself to tolerances in rail base dimensions.*

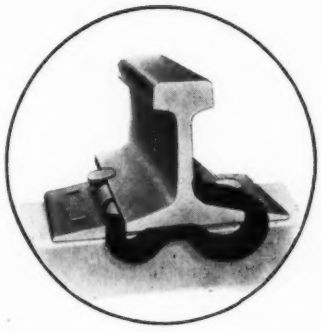
THE WORLD'S MOST
POWERFUL RAIL ANCHOR

Woodings FORGE & TOOL CO.

Chicago • VERONA, PA. • St. Louis

greater service with the *Improved* GAUTIER

Rugged, sure-gripping improved Gautier Rail Anchors work 'round-the-clock on heavily scheduled railroads. The Improved Gautier is made of tough, durable alloy steel, it is easily applied with a maul or spike maul and can't be over-driven. Engineered to last the life of the rail, it has the highest reapplication value. Improved Gautier Rail Anchors are in constant use on railroads throughout the country—it is truly *the finest of Rail Anchors.*



Manufactured and Sold exclusively by

MID-WEST FORGING & MANUFACTURING COMPANY

General Offices: 38 South Dearborn Street, Chicago 3, Illinois. Mfg. Plant, Chicago Heights, Illinois

1931-*1952*...MODERN BALLAST CONDITIONING

Proven

Over 21 Years

Complete

Ballast Conditioning Trains Entirely Self-Contained on Our Own Standard Railroad Equipment

R.B.C.C. five-unit trains do a thorough ballast conditioning job on *both sides* of the track in one pass, two center ditches, two shoulders, or one of each.

R.B.C.C. three-unit self-propelled trains (photo above) do a thorough ballast conditioning job on *one side* of the track *in one pass;* one center ditch, or one shoulder.

No other equipment for outfit cars or dirt handling need be furnished by the Railroad. No railroad cars are tied up, as our equipment with complete facilities stores and disposes of all dirt removed from fouled ballast. Each train contains a complete maintenance shop and store room.

One track only is occupied by these trains to do a thorough job of ballast cleaning, complete excavating, and dirt disposal. Adjoining tracks can be cleared *in one minute* when necessary.

BEFORE

AFTER

BEFORE

AFTER

RAILWAY BALLAST CONDITIONING CORPORATION

R B C C

Picture Proof of thorough ballast conditioning. Unretouched photos of actual contract service show before and after cleaning with our equipment.

R.B.C.C. ballast cleaning and excavating service, complete with personnel and equipment, is handled on contract basis.

RAND TOWER, MINNEAPOLIS, MINNESOTA • METROPOLITAN BANK BLDG., WASHINGTON, D.C.

Continuous operation, during the entire work season for fourteen Power Ballasters. That was the report made by Northern Pacific's maintenance engineers. Their fifteenth Power Ballaster was out of service for only one day during that period.

Power Ballasters are built by Pullman-Standard to stand up, on the job, day after day. Maintenance is cut to minimum time out for minor repairs on location. And they keep producing through a long life span.

The unit shown above is working on the Northern Pacific at milepost 72 near St. Cloud, Minn. It is tamping a 0" to 8" lift on westbound track to make a run-off both ways from a crossover switch. The rail is 112lb. 1940 and the ballast is St. Cloud crushed granite averaging 2" in size.

Easy, economical operation results from many exclusive features. The Power Ballaster is completely self-propelled; has a running speed of 25 m.p.h.; and has a self-powered set-off mechanism which enables four men to set the unit off laterally in 3 to 5 minutes. Delays due to train interruptions are therefore reduced to a minimum. The Ballaster's high production rate makes maximum use of available track time.

Simple, two-lever control permits operator to keep work moving smoothly, rapidly, efficiently. Automatic controls assure uniformity.

Meets A.R.E.A. specifications. Because the Power Ballaster has 32 tamping bar positions and five different sizes of quickly interchangeable tamping bars, the Power Ballaster: (a) is a universal machine, (b) produces a "squared" under tie-and-rail area of ballast compaction fully meeting A.R.E.A. specifications, and uses the production tamping methods specified by the A.R.E.A. *Lower Right:* Diagram shows triple-action compaction.

W. W. JUDSON, *Vice President,* Operation and Maintenance of the Northern Pacific, tells about the performance of their 15 Pullman-Standard Power Ballasters, during *four* work seasons. (*see next page*)

SUBSIDIARY OF

PULLMAN-S

ROAD & TRACK EQUIPMENT DIVISION

BIRMINGHAM • CLEVELAND • PITTSBURGH • NEW YORK • WASHINGTON • SAN FRANCISCO • 79 EAST ADAMS STREET

Pullman-Standard POWER BALLASTERS

The dependable, "ready-to-work" characteristic of the Power Ballaster is recognized as an important feature by many track maintenance engineers. These tampers are ruggedly built to stay with the job. Yet are designed to facilitate minor repairs or adjustments on location by the Ballaster operator. A Pullman-Standard course for teaching the railroad's own personnel efficient maintenance and power tamping procedures also helps assure maximum output, minimum delay.

on the Northern Pacific prove

The complete dependability of the Power Ballaster is further assured by factory field service men and stand-by spare parts stocks—ready to meet any emergency, anywhere. Operating performance, under all ballast and raise conditions, is field-studied each work season by Pullman-Standard's engineers. Thus, even further improvements in the Power Ballaster's design are developed and new labor-reducing gang line-ups are determined.

high availability, low maintenance

That's why the Power Ballaster has the highest established equipment availability, the lowest maintenance and labor requirements and the highest production rate of any production tamper available today.

You can prove, while tamping your own ballast, the time- and money-saving advantages of the Power Ballaster. Choose one of these four ways: (1) outright purchase; (2) rental for 90 days, with option to buy; (3) straight rental for a minimum period of three months; (4) deferred quarterly payments over a period of 1 to 3 years. The rentals and deferred payments are established at substantially less than the realizable savings accruing during the payment periods.

"The Northern Pacific has had *fifteen* of the first postwar built Pullman-Standard Power Ballasters in regular operation for four work seasons. Quality of work being done by these units is impressive, but equally important, our experience with these 15 Power Ballasters prove their reliability.

During the last work season, available production time lost due to mechanical delays was at a bare minimum and at no time was it necessary to call for factory service.

One reason for this good record is that the Power Ballaster is engineered in such a way that all moving parts are readily accessible for routine maintenance."

Here's what YOU can expect from the POWER BALLASTER:

- Longer Lasting Track
- More Production—Lower Labor Requirement
- Long Equipment Life
- Maximum Use of Track Time
- Easy Operation and Maintenance
- Universal Application—Versatile Production

Your Assurance: PULLMAN-STANDARD has been one of the great U.S. railroad equipment suppliers for 73 years; its time proven integrity and reliability are behind the POWER BALLASTER to protect your equipment investment and to assure a factory stand-by of spare parts and continuing factory service.

Write for booklet containing complete detailed engineering data and operating facts about the POWER BALLASTER

PULLMAN INC.

PULLMAN-STANDARD CAR MANUFACTURING COMPANY

CHICAGO 3, ILL. • CANADA: THE HOLDEN CO., LTD., MONTREAL • TORONTO • WINNIPEG • VANCOUVER

THERE'S A BIG

HOMELITE

When you buy a Homelite pump, generator, blower, or chain saw, you buy a superior product. You get outstanding performance and real dependability, the results of Homelite's 30 years' experience in manufacturing gasoline engine driven units. And with this, you get a plus . . . a big plus...*service* of unusual caliber.

Covering the entire country, there are 45 Homelite factory branches . . . fully staffed by Homelite men and completely stocked with Homelite parts. These factory branches are Homelite branches *exclusively* . . . servicing Homelite products exclusively . . . serving Homelite customers exclusively. They are established, located and equipped to bring factory precision service to you *in the field* . . . in the fastest possible way.

CALL
ANY OF THESE
HOMELITE
FACTORY BRANCHES FOR
PROMPT, EFFICIENT SERVICE

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Atlanta, Georgia – Crescent 5845
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Bloomfield, Conn. – Hartford 7-0444
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Boston, Massachusetts – Stadium 2-4455
Buffalo, New York – Fillmore 1515
Charlotte, N. C. – Charlotte 2-5855
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Cleveland, Ohio – Shadyside 1-6171
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Jacksonville, Fla. – Jacksonville 3-5475
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Los Angeles, California – Angelus 0186
Lufkin, Texas – Lufkin 8
Memphis, Tennessee – Memphis 4-1660
Milwaukee, Wisconsin – Hilltop 2-2505
New Orleans, La. – Temple 2707
New York, N. Y. – Cortland 7-2523
North Arlington, N. J. – Kearny 2-3500
North Salt Lake, Utah – Salt Lake 9-4216
Omaha, Nebraska – Atlantic 8085
Philadelphia, Penna. – Lombard 3-0614
Pittsburgh, Penna. – Allegheny 1-7263
Port Chester, N. Y. – Port Chester 5-3400
Portland, Oregon – Murdock 3309
Rochester, New York – Monroe 4676
Roseburg, Oregon – Roseburg 3-5295
Sacramento, Calif. – Hillcrest 6-6068
St. Louis, Missouri – Sweetbriar 3537
St. Paul, Minnesota – Prior 1852
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Carryable Pumps • Generators
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PERFORMANCE · DEPENDABILITY · SERVICE

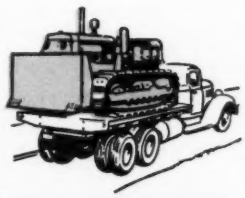
HOMELITE
CORPORATION
203 RIVERDALE AVENUE • PORT CHESTER, N. Y.

NOW ... Revolutionary Bulldozing Performance

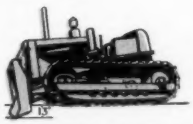
72 Drawbar Hp.
Weight with Dozer, 21,500 lb.
6 speeds forward, 3 reverse

WITH THE ALLIS-CHALMERS HD-9 TRACTOR AND NEW 9X no push-beam DOZER

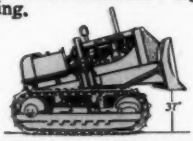
This major bulldozer design improvement brings you a new narrow-width blade for easier transporting by highway . . . new high blade lift for more effectively rebuilding road beds . . . new high clearance underneath — new shorter overall length for greater maneuverability, as well as new dirt-moving ability, new low original cost, new ease of servicing and new operator comfort. Here's what makes this dozing combination most productive for any railroad work:



EASIER HIGHWAY TRANSPORT. Blade is but 8 ft. wide—no transport permit needed.



BITES DOWN HARD. Full 13-in. drop below ground, positive down pressure plus steep angle of penetration means fast digging.



HIGH LIFT. Full 37 in. above ground. Excellent for pushing over trees and stumps and clearing brush.

A GREAT TRACTOR. This popular Allis-Chalmers HD-9 Tractor has power, weight and balance that puts it in a class by itself—never such traction . . . such pushing and pulling ability.

A REVOLUTIONARY TEAM. Here is a tractor-dozer combination designed together as a unit, which compares in performance with conventional "dozers" weighing from five to six thousand pounds more.

NO PUSH BEAMS. A completely new idea in bulldozer engineering, the Baker 9X blade is mounted directly to the HD-9 main frame. Tractor main frame and dozer are raised and lowered as a single unit.

LIGHTER WEIGHT—BETTER STABILITY. Almost 1,150 lb. lighter than standard dozer. Costs less to buy. And with lighter blade mounted 15 inches closer, tractor center of gravity is not upset. No excess wear on front truck wheels and support rollers.

BIG DIRT MOVER. Because of extra clearance, greatly increased track oscillation and better balance, this team is a phenomenal performer in mud and tough going. And with blade fully six inches higher, capacity is kept on par with conventional blade.

SIMPLIFIED SERVICING. 1,000-hour lubrication of truck wheels, idlers and support rollers. Dozer mounting does not interfere with engine accessibility. No removal of major tractor assemblies. Hinged grill swings out for easy access to dozer hydraulic pump, or to clean radiator core.

EASY TO OPERATE. Just by pulling a single lever, operator can shift from any of the six forward speeds to any of the three high-speed reverses. This, plus narrow, frame-mounted blade makes the HD-9 particularly fast and maneuverable. With no spring deflection, blade responds immediately and positively to control levers.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

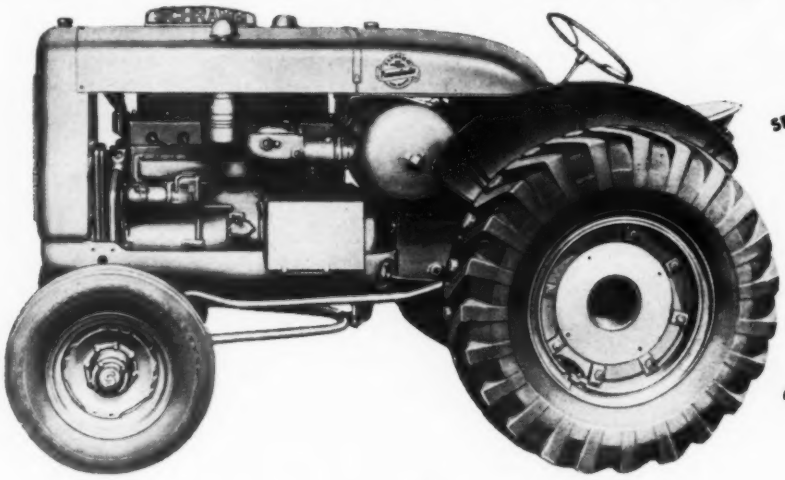
PERFECT *for eight-tamper gangs*

ROCK DRILLING

TIMBER SAWING

ANY AIR JOB

SHEET PILE DRIVING



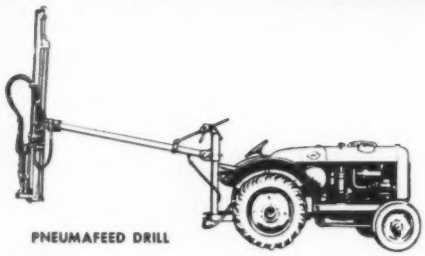
SPRAY PAINTING

CONCRETE BREAKING

EARTH SPADING

TRACK STABILIZATION (PRESSURE GROUTING)

and now Pneumatractor

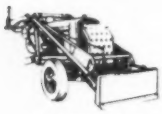


PNEUMAFEED DRILL

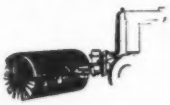
FRONT END LOADER

TIE TAMPING

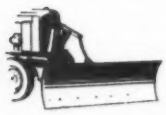
FRONT WINCH



BACKFILL BLADE



ROTARY BRUSH



SNOW PLOW

SKYWORKER

DRIVING SHEETING

ROCK DRILL

REAR WINCH

with auxiliary equipment the *Pneumatractor* does many jobs

The Plus Compressor is DEZOIL *as well as gasoline powered*

Now, in addition to the *Pneumatractor's* many other advantages, you may choose a Dezoil power plant which gives you even greater economy through the use of diesel fuel instead of gasoline. But whatever the fuel, here is your dependable, completely mobile air supply for any air job. The *Pneumatractor's* 105-foot air capacity serves eight tie tampers or an adequate number of paint sprayers, sheet pile drivers, or other air tools. And its revolutionary Pneumastat control gives you economy such as you have never known—actual *proved* savings up to 50 per cent!

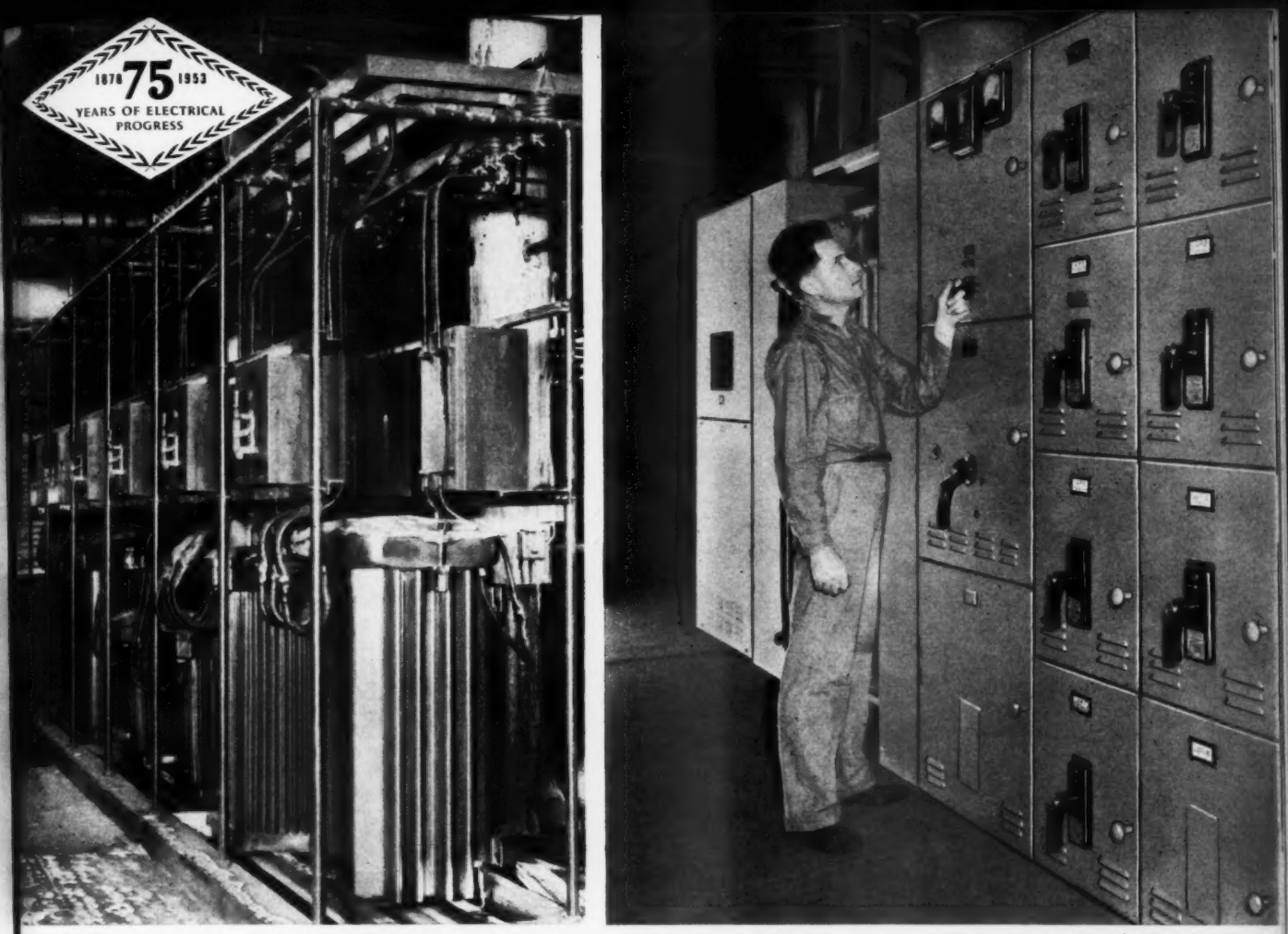
Yet the *Pneumatractor* is more than a compressor, more than a tractor with power take-off. Fitted with auxiliary attachments, it is a veritable fleet of mobile power machines all in one. Some of its extra uses are shown at the left; your own ingenuity will suggest others. All this means less idle time for your *Pneumatractor* and greater return on your investment.

To make an intelligent choice of a compressor or any tamping equipment, you need, for comparison, full details regarding the *Pneumatractor* Write Schramm's Railway Sales Department for your copy of Bulletin NEU-53 today.

SCHRAMM INC.

The Compressor People

WEST CHESTER • PENNSYLVANIA



G-E load-center unit substations eliminated transformers and pipe framework; saved over 400 sq. feet of valuable floor spac

Reading Terminal Meets Power Demands With G-E Load-Center Unit Substations

The Reading Terminal, Philadelphia, Pa.—To meet new, increased power demands, the modernized Reading Terminal recently installed a G-E load-center power distribution system here.

As a result, the Reading Terminal now has improved voltage control and is assured continuous service with higher interrupting capacity. Also, because no live parts are exposed, these completely metal-enclosed G-E unit substations afford more protection for employees.

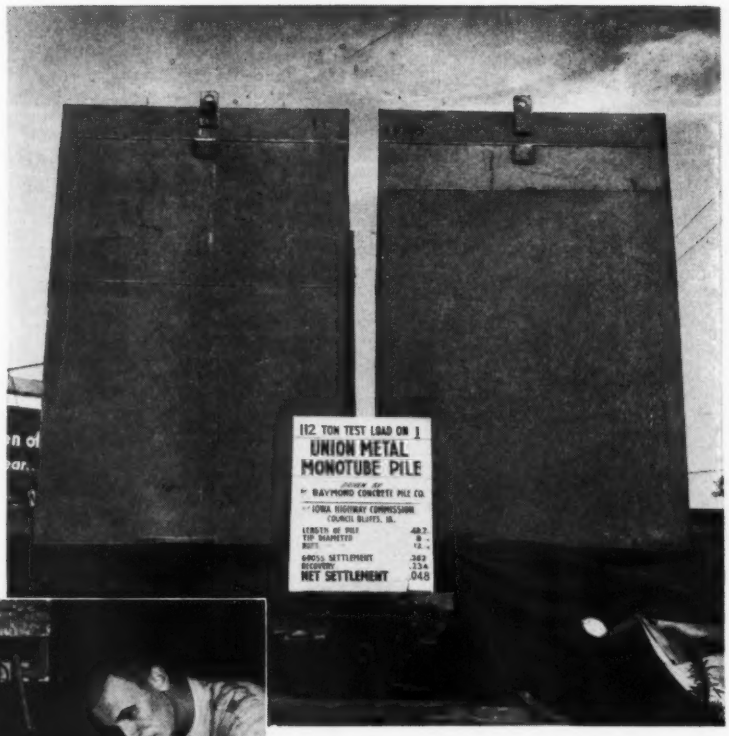
Whereas power was formerly distributed to the load by heavy, low-voltage cable, high-voltage power now is brought directly to unit substations located near the load. This change alone eliminated over 25 tons of low-voltage cable from the Terminal.

Compact G-E load-center unit substations can add economy and improved service to your railroad installations. Ask your nearest G-E apparatus sales representative for details. General Electric Company, Schenectady 5, N. Y. 152-40

You can put your confidence in—

GENERAL ELECTRIC

Predesign pile loading tests



Above: Four large water-filled steel tanks provided a dead load exceeding 120 tons in recent friction pile tests for the Iowa State Highway Commission.

Left: During Monotube testing, dial readings were taken at specified time intervals as load increments were applied. Scales shown are only two of several reference points on instrumentation framework, which were checked by wye level each time readings were taken.

PREPARATORY to designing an overpass near Council Bluffs, the Iowa State Highway Commission conducted a series of pile loading tests. Careful engineering preparation and unusually thorough instrumentation provided highly accurate test results.

A 40-foot Monotube in fine brown sand was loaded to 112 tons with a settlement of only 0.048 inches. Specified load increments were applied by means of a hydraulic jack bearing against the 120-ton dead-weight of 4 water-filled steel tanks.

If you have foundation problems coming up, check with Union Metal for helpful engineering service . . . for accurate Monotube pile test data . . . and for the latest information on modern, easy-to-drive piles that can save you plenty of time and money. Write to The Union Metal Manufacturing Company, Canton 5, Ohio.

Monotube Foundation Piles

UNION METAL

Car does more maintenance—needs less—
with help of TIMKEN® bearings

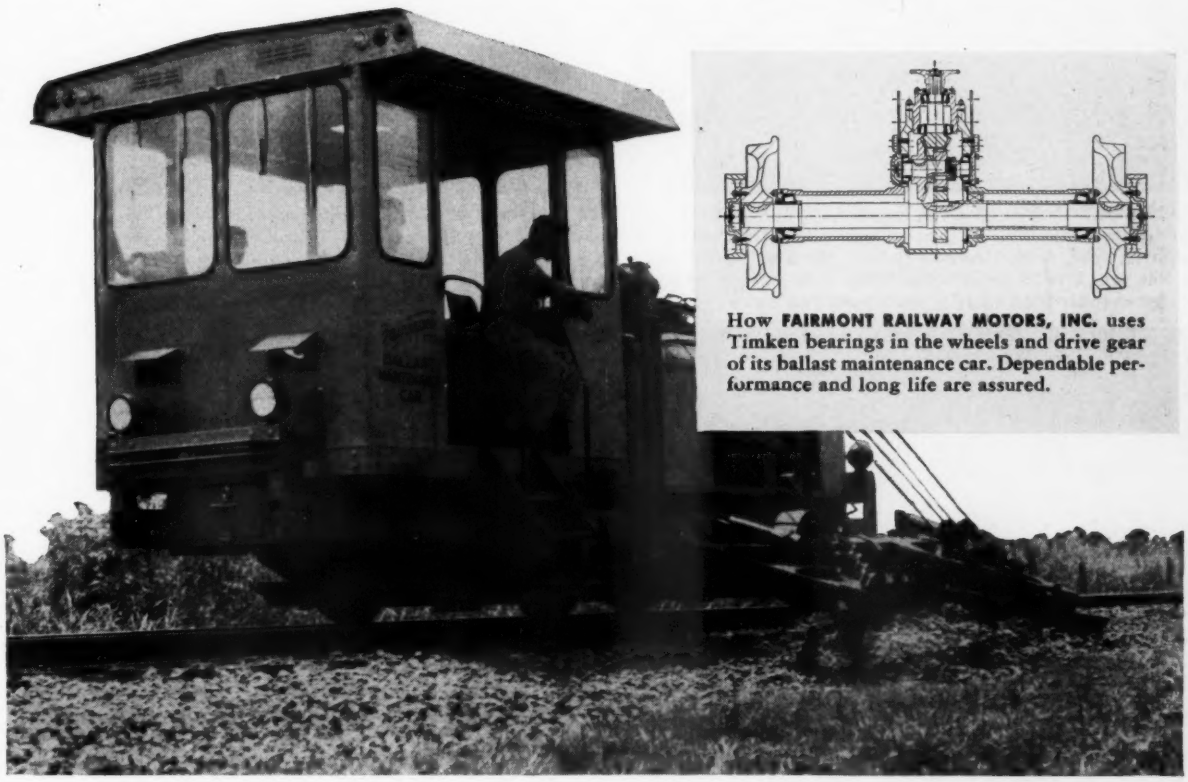
THIS ballast maintenance car, built by Fairmont Railway Motors, Inc., can do more maintenance because it mounts six different work tools. They are: scarifiers, a ten-foot blader, a 76-inch blader, ballast equalizing boxes, discs and a center plow. And with Timken® tapered roller bearings in the wheels, drive gears, speed reducers and transmission, the car itself requires less maintenance and is assured of longer life and lower operating costs.

Timken bearings take radial, thrust and combination loads due to their tapered construction. Line contact between rollers and races provides capacity to spare. Shafts are held in perfect alignment, reducing wear on moving parts. Gears mesh smoothly, accurately, assuring longer gear life.

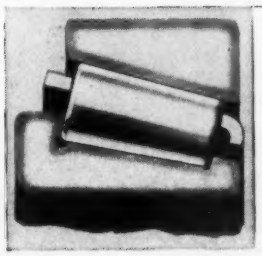
Housings and shafts are held concentric by Timken bearings, making closures more effective. Lubricant stays in—dirt and moisture stay out. You save on lubricants and maintenance. And because Timken bearings have true rolling motion and an incredibly smooth finish, friction is practically eliminated. Wheels turn easier and there's less chance of breakdown on the job.

No other bearing has all the advantages of Timken bearings. Specify them for all the machines you build or buy. And look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **FAIRMONT RAILWAY MOTORS, INC.** uses Timken bearings in the wheels and drive gear of its ballast maintenance car. Dependable performance and long life are assured.



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

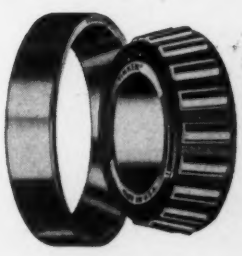
Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS



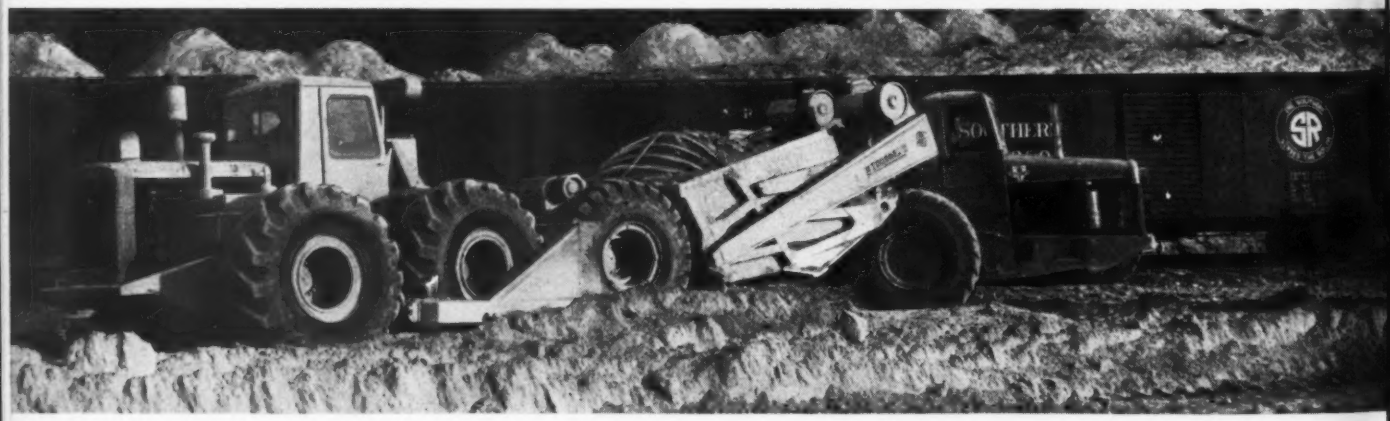
NOT JUST A BALL • NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER — BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION

PICTURES

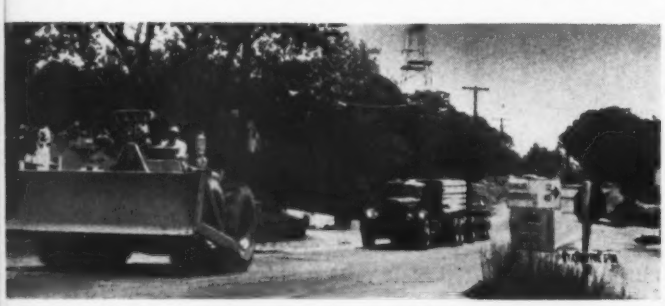
show LeTourneau high-speed method of Railroad maintenance

LEVELING FOR GRADE CROSSING along mainline right-of-way, rubber-tired Tournatractor dozes 2½ cu. yds. of clay and gravel per pass. With 19 mph forward, 8 mph reverse speeds, the one Tournatractor completed this job 2 to 3 times faster than slow-moving crawler-tractor . . . far cheaper than could a work train and crew.

DRIVING TO NEXT JOB at speeds to 19 mph saves delays, gets more work done. Tournatractor's big low-pressure tires straddle rails . . . travel along right-of-way . . . do not chamfer ties, tracks, switches, or trip automatic block signals. Rig crosses bridges, trestles . . . takes shortest route to next job . . . goes right to work.



PUSH-LOADING SCRAPER, Tournatractor's 4-wheel drive speeds construction of new railroad siding in northwestern Montana. Rig also *pulls* Scrapers, Sheepsfoot Rollers, Rooters, Wagons, and other heavy equipment for big dirtmoving jobs. Tournatractor's dependable electrical system supplies 120 and 220-volt current for emergency lighting or temporary equipment operation.

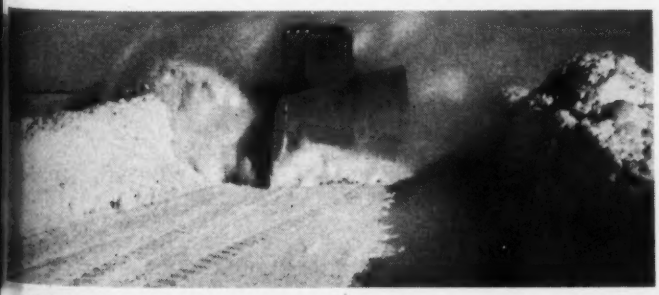


TRAVELING VIA HIGHWAY to distant maintenance or emergency tasks rig covers a mile in less than 4 minutes. This high speed simplifies dispatching. Operator just hops on and goes . . . does not have to bother with loading, blocking and unloading necessary when

HANDLING SLIDES, WASHOUTS and other emergency dozing is another fast job for Tournatractor. Here it clears rock slide from right-of-way. Tough treads and rayon cords absorb shock. Power travels on anti-friction bearings . . . eliminates abrasive drag, repairs, and lubric-

GRADING FOR DRAINAGE, Tournatractor's electric-control bulldozer blade gives fast, smooth dozing action. Other quick jobs: repairing washouts . . . clearing right-of-way . . . spreading ballast . . . aligning track . . . filling in bridge approaches . . . trimming side slopes.

SPOTTING CARS or handling emergency switching is easy with Tournatractor. Speed changes instantly with constant-mesh transmission (torque converter optional). There is safe control in big 4-wheel disc air brakes. Fingertip electric controls reduce operator fatigue.



WORKING YEAR 'ROUND, Tournatractor plows snow in winter. With addition of V-type Snow Plow, rig easily busts deep drifts . . . opens yards, sidings, loading tracks, or access roads. Can travel around snowbound equipment, open line from either side. Interchangeable

STOCKPILING COAL, cinders, ballast, or other materials, high-speed Tournatractor handles 2 to 3 times more yards per hour than crawlers. Rig's big tires again pay off . . . assure safe compaction of coal and other combustible materials without grinding them to fines . . . help reduce possibility of spontaneous combustion.

R. G. LeTOURNEAU, INC., Peoria, Illinois

Gentlemen: Please send complete information on LeTourneau machines checked below:

☐ Rubber-tired 186 hp Tournatractor

☐ ?-yd., 122 hp Tournapull-Scraper

Check picture above for tools in which you are interested and send in coupon. We'll be glad to arrange a demonstration on your division at your convenience.

Name _____

Title _____

Company _____

Address _____

LETOURNEAU LET EQUIPMENT

Research-Proved

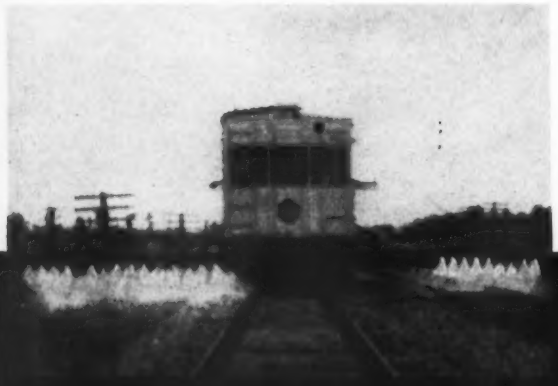
HERBICIDES

for

Roadbed

and

Right-of-Way



The R. H. BOGLE Company

ALEXANDRIA, VA.

TRADE MARK R B H

"QUICK-WAY" digging drainage ditch.

"QUICK-WAY" used in rehandling manure.

"QUICK-WAY" dragline moves ballast.

"QUICK-WAYS" VS. WORK TRAINS

Used to **SAVE MONEY** in handling materials, relaying rails and maintenance on all parts of the system, 3 machines in Seattle, 2 in Montana Districts, 2 in Duluth-Minneapolis, 1 in Lewiston, Idaho, 1 in Portland.

After an initial test of one machine in 1947, a total of 9 "QUICK-WAYS" are now used for the following purposes:

1. For rail yards in piling new and used rails, loading and unloading rails.
2. For rail relay work, handling and placing up to 125 rails per day.
3. For ditching, laying pipe, drainage and back-filling along right-of-way.
4. For handling heavy timbers on bridge work.
5. For removing ballast between double tracks.
6. For rehandling manure removed from stock cars.

Tremendous savings are being made by use of small machines which move between jobs on highways and work on and over railroad beds saving expense of work trains doing rail relay, ditching and drainage work along the right of way and handling numerous small jobs over the entire system which large machines cannot handle with any degree of efficiency due to their size, weight, and excessive cost of transportation.

"QUICK-WAYS" have dozens of uses in numerous types of jobs—handle aggregate, building materials, excavation work, dig ditches, drive pile, pour concrete, set steel, etc. Easy to move from job to job. Eight attachments. Four sizes from 3 to 10 ton crane capacity.

Only **"QUICK-WAY"** *gives you* "QUICK-WAY" quality construction—all steel for strength and lightness, accurate balance, high capacity to weight ratio. Ask your distributor for a free demonstration.

"QUICK-WAY" with crane attachment loading rails from stock pile to flat car.

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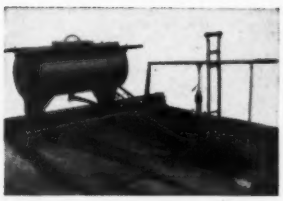
WOOLERY self-propelled off-track Joint Oiler with three operators can spray joints on 1½ miles of track per hour. Uses heavy lubricants heated in 25-gallon tank and sprayed into joints under pressure, for thorough, long-lasting economical lubrication. Only 30" wide, to operate easily or turn around between double tracks.

WOOLERY Tie Plate Spacer quickly and accurately locates single or double shoulder plates at exact position on ties. Light in weight so that one man can easily handle it on or off track. Simple adjustment allows for changes in rail sizes. Ruggedly built for long service, this machine greatly speeds the job of rail laying.

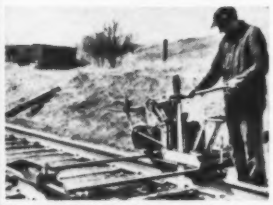


WOOLERY Creosote Sprayer, with 60 gallon tank capacity. Equipped with generator burner to heat creosote, and wind protection hood to safeguard operators. It applies a metered amount of creosote to each freshly-adzed tie. Does a safer, more economical and uniform job than is possible by old fashioned hand swabbing or broom-and-pail methods.

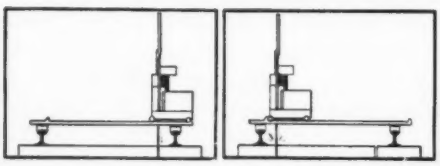
Manufacturers of Tie Cutters, Tie End Removers, Tie End Trimmers, Power Bolt Tighteners, Spike Drivers, Motor Cars, Push Cars, Tool Transporters, Weed Burners, Extinguisher Cars, Chemical Sprayers, Tie Plate Spacers, Creosote Tie Sprayers, Rail Nippers, Flangeway Cleaners, Rail Joint Oilers, Power Joint Lubricators.

WOOLERY MAINTENANCE MACHINES *for* Better Track & LOWER COST!

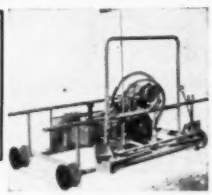
The WOOLERY Team for Greater Savings in Tie Renewals!

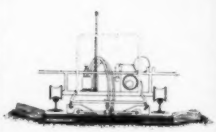


The WOOLERY Tie Cutter provides a proven money-saving method of removing old ties without trenching, jacking up track, or adzing tops of rail-cut ties.



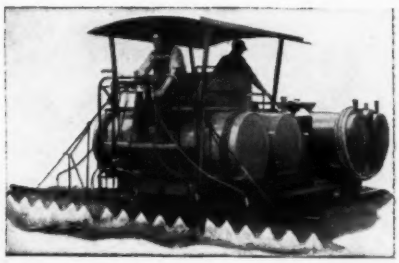
After tie has been cut on both sides, the operator of the NEW WOOLERY TIE END REMOVER removes center section in the usual manner with tie tongs and then moves the NEW WOOLERY TIE END REMOVER into position and drops the double-ended hydraulic cylinder into the tie-bed. A simple turn of the valve pushes the tie-end completely clear of the rail.





WOOLERY 300 Motor Car gives advantages of a light car, plus greater pulling power with 4 wheel drive and heavy duty performance. Carries 8 men and track tools. Can be fitted with detachable WOOLERY Flangeway Cleaner for winter duty.

WOOLERY Model PB-B Weed Burner will destroy a swath of weeds 15 feet wide in one trip or up to 25 feet with burner arms extended on second run. All three burners have electric ignition and individual controls. Only two operators required. Other WOOLERY Weed Burners in 1-burner and 5-burner models.



WOOLERY dual purpose Combination Sprayer and Weed Burner permits choice of chemical spraying (near buildings or in areas where burning is not practical) or weed burning, as desired. Chemical sprayer, covers 18-foot swath. Burning unit at opposite end covers 15 feet first trip; up to 25 feet second trip.

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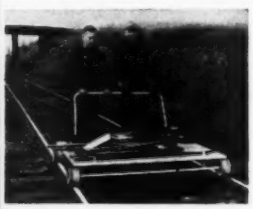

This handy, lightweight push car carries tools to the job site from unloading point. Men don't have to tote tools and equipment—save time and muscles for the important job!

are engineered to make light work of tough jobs

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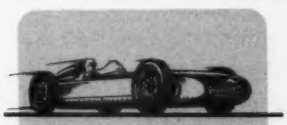

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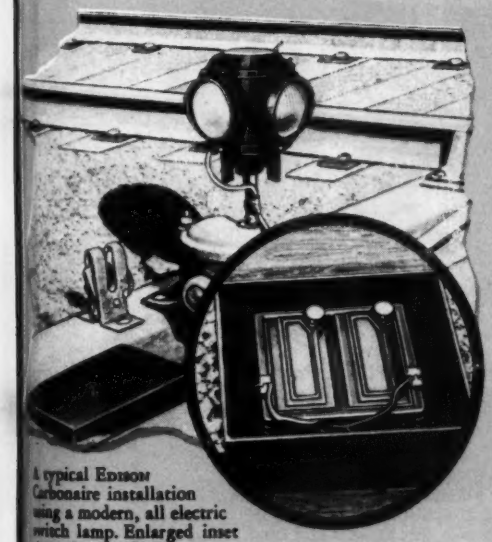

A typical Edison Carbonaire installation using a modern, all electric switch lamp. Enlarged inset shows battery detail.

The conversion of switch lamps to battery operation with the Edison Carbonaire is one of the most practical methods of cutting operating costs that has been offered to the railroads in the past two years.

The operating saving averages *$25.00 per lamp per year* over the cost of oil. Multiply this saving by the number of lamps under your jurisdiction and the full potential saving is readily apparent.

The saving on investment is generally 40% or more—and this saving is 20-25% greater than can be realized even by the use of a-c power.

With most operating costs still on the upswing, *now* is the time to take advantage of this cost-cutting system. A planned program of regular conversions by districts, divisions or even by yards or terminals, can begin to pay off for you *before* the end of this year.

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No. 291 of a series

RAILWAY TRACK and STRUCTURES

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 WEST MONROE STREET
CHICAGO 3, ILL.

Subject: Are We Superficial?

March 1, 1953

Dear Readers:

One of the subjects discussed at a recent meeting of a group of business paper editors was the question: Are business magazines becoming superficial? Since the question was brought up only shortly before the meeting was scheduled to adjourn, the time that could be devoted to it was entirely inadequate. I am personally convinced that this subject is so important that it deserves a great deal more than a few minutes of superficial discussion.

To be certain of my ground in discussing it here, I went to the dictionary for a definition of the word "superficial," as an adjective, and found this: "Not penetrating beneath the surface or farther than the easily or quickly apprehended features of a thing; concerned only with the obvious or apparent; cursory, hasty, casual; as, a superficial investigation or observation, lacking in depth or substantial qualities . . ." After reading this definition two thoughts occurred to me in rapid succession: First, being superficial is much easier, requiring a great deal less effort and energy, than being thorough and penetrating; and, second, for us to be superficial in editing this magazine would be dodging our responsibility to our readers. The publication would be of little or no value to you if it presented only obvious information, indulged in surface observations, or dealt with subjects in a cursory, hasty or casual manner.

The difficulties of editing a magazine in a thorough and penetrating manner are very real. It is first necessary to impose the self-discipline that is required in doing a job the hard way. Then we have to decide how far to go in developing and presenting the various subjects. We are caught here on the horns of a dilemma. We want as much as possible of the material in the magazine to be read thoroughly by as many as possible of our readers. Yet we know that, in view of the many attractions and diversions of modern living, this intensive readership is not going to be realized if the articles are long, wordy and cumbersome to read. What the problem boils down to, then, is a matter of presentation, using pictures, graphs and charts in place of words whenever possible.

There are those who may have the opinion that an article doesn't represent a thorough treatment of the subject unless it consists of page after page of text. This may be true for some subjects, but with others it is possible to make photographs and charts do the work of many words. What's more, it may actually require more time and effort to develop a graphical method of presentation than to tell the same story in many words. I am sure of this because I know how much time and effort went into the preparation of some of the graphical material in this issue.

What I am trying to say here is that our job, as we visualize it, is to be penetrating and thorough in developing articles for this magazine, but to do it in such a way that you can get the gist of the material in as little time as possible. If we can develop ways of presenting our articles so that they will be as quickly and easily read as they would be if the treatment were superficial, we will be satisfied.

Yours sincerely,

Merwin H. Dick

Editor

MHD: lw

Members: Audit Bureau of Circulations and Associated Business Publications

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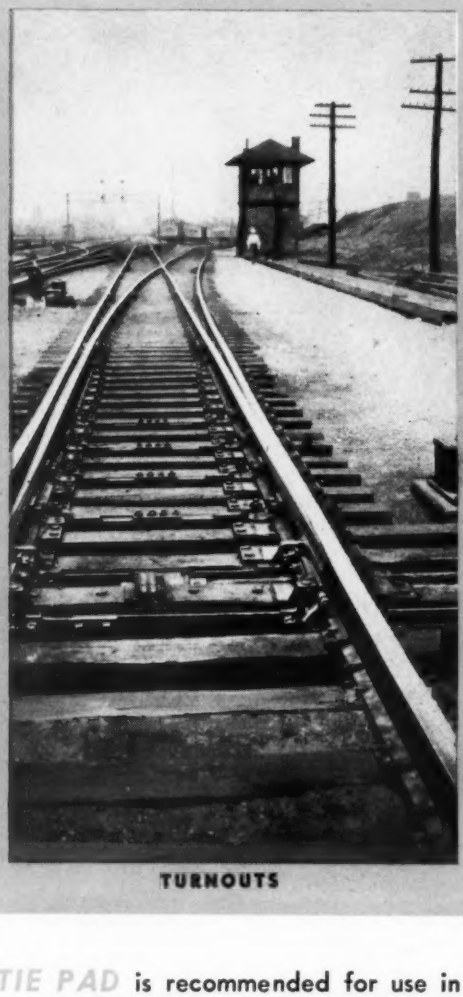

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BRIDGES

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The RACOR TIE PAD is the result of years of intensive research directed toward combating tie wear. Severe comparative tests on the RACOR TIE WEAR MACHINE have proven the RACOR TIE PAD to be the most *effective*, *durable* and *economical* Tie Pad in preventing mechanical abrasion of railroad ties and bridge timbers.

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ALL RACOR TIE PADS (unless specifically ordered otherwise) are coated with an asphaltic compound that is stable over a wide temperature range. This coating seals the pad to the tie and prevents the entrance of foreign materials, such as sand, dirt and water between the pad and tie, thus providing maximum protection to the wood immediately under the tie pad.

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1. materially reduce or eliminate plate cutting.
2. reduce spike killing.
3. retard the softening of wood fibres under the tie pad.

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2. delay the deterioration of the tie.

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4. extend the effectiveness of the tie plate fastenings.

In areas where severe tie wear, high maintenance costs or expensive ties exist, it will be to your advantage to seriously consider the use of the RACOR TIE PAD. The economies possible through its use will bring savings that were heretofore impossible.

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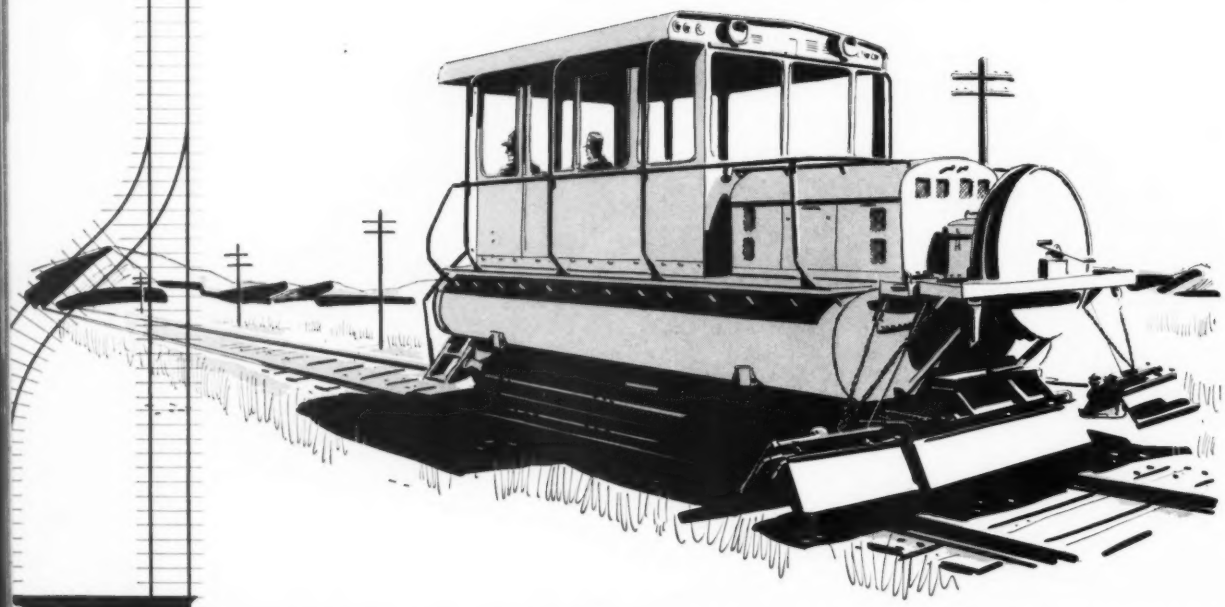

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Member of the Associated Business Papers (A.B.P.) and of the Audit Bureau of Circulations (A.B.C.), and is indexed by Engineering Index, Inc.

PRINTED IN U.S.A.

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Associate Editor

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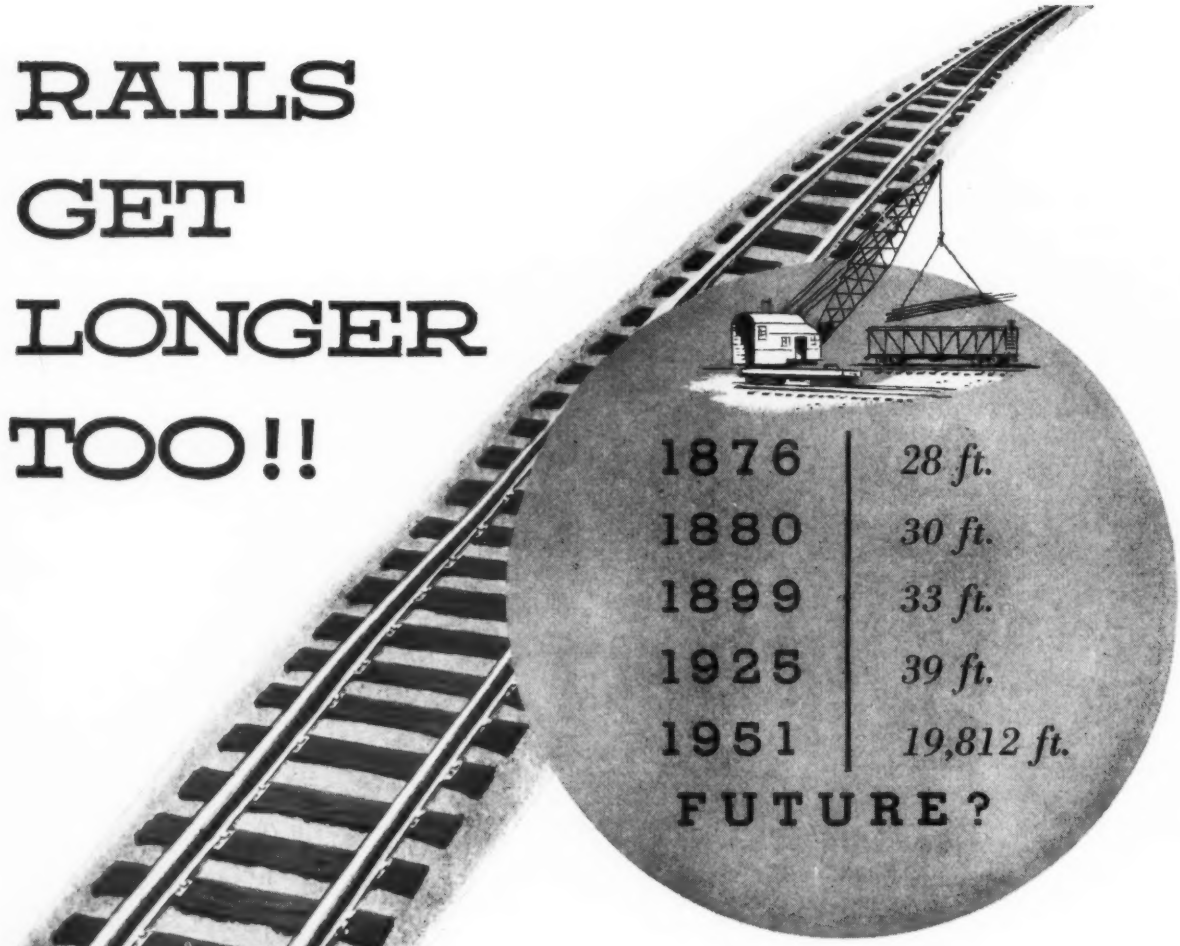
RAILS GET LONGER TOO!!



Full-length cables for suspension bridges and skyscraper elevators are made in one piece — not by fastening short lengths together. For these and similar jobs, fabrication methods had to be developed to produce mile-long materials.

Engineering always produces the material to fit the application

Until recently, the thinking on rail lengths in railroad track construction was governed by the usual means of transportation — the 40-ft. gondola. This outmoded "guide" to rail lengths is upset by the fact that more and more railroads are producing continuous welded rail with OXWELD'S RIBBONRAIL Service and equipment. And they find transportation no problem — push-cars, flat cars, or skids will efficiently handle rail of any length.

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RAILWAY TRACK and STRUCTURES

Editorial Comment

Diesel Power —

Gives New Slant to Old Problem

There is one aspect of their responsibilities regarding which railway engineering officers can permit themselves the luxury of a slight feeling of relaxation. For about the first 100 years in the life of the railroad industry the weight and size of rolling stock, particularly locomotives, were continuously increasing. The result was that track and bridge engineers were almost constantly faced with the problem of building new strength into the properties to carry the heavier loads. It was seemingly a never-ending race to keep the properties abreast of the growth of rolling stock, with the properties necessarily always somewhat in the rear of the procession.

Under the impetus of this situation the weight of rail was gradually increased until sections weighing 131 lbs., or even more, became standard for heavy-duty track on many roads, with other components of the track structure undergoing a proportionate increase in size and strength. Bridges, likewise, had to be made progressively stronger until Cooper's E-72 loading became accepted as necessary for structures on many lines.

Then, suddenly and dramatically, the pressure relaxed. The diesel locomotive, with its somewhat lighter wheel loads, and no dynamic augment, moved in and is now rapidly displacing steam power on the great majority of roads. Although many questions remain to be answered regarding the effect of diesel locomotives on the tracks and bridges compared with steam power, the consensus is that modern heavy-duty track is entirely adequate to carry diesel wheel loads, probably with a comfortable factor of safety left over. What's more, there seems to be little possibility that the size and weight of individual diesel units will undergo any marked increase in the foreseeable future. It is true that new types of locomotive power, such as the gas-turbine, are under study, with a few such units being in regular service today, but their development has not reached the point where they are a factor for the average track or bridge man to worry about.

Thus, for the first time in history many railroads have tracks and bridges that, in general, are apparently at least adequate to carry present and prospective loads. This does not imply that there is any immediate prospect of a trend toward lighter construction. While there may be isolated instances of such a trend, there are strong arguments for continuing present standards. One is that the strength is necessary to assure safety of operation at high speeds. For another, the heavy construction is certainly a potent factor in assuring maximum economy of maintenance. In fact one large road, in extending heavy construction to its branch lines, using relayer rail, is realizing substantial economies of maintenance, even under light-traffic conditions.

At the same time it is unthinkable that track construction has reached the peak of its development. Although the need for keeping up with increasing wheel loads has largely disappeared, what about the factor of cost of maintenance? How many track men are prepared to admit that nothing further can be done to the track to give it greater durability? Very few, we suspect. There is an imperative need to reduce maintenance costs; it may even be greater in the future. It is the pressure of this need that will keep track men from relaxing too long and too well over the fact that they are no longer hounded by increasing wheel loads.

Editorial Comment

ROADWAY MACHINES—

Why Do Some Men Get More Than Others?

ONE of the most lamentable conditions pertaining to the maintenance of track and structures today is the continuing reticence of some supervisory officers to ask for as much equipment as they can use economically. Admittedly, this reticence may not be entirely premeditated, but the result is just as poor as if it were. However, it might even go unnoticed if it did not, once in a while, run headlong into a comparison with the effect of an opposite attitude.

Take for instance the case of that particular "equipment-conscious" supervisor, such as we have all met, who seems to have more equipment than any of his neighbors. These neighbors usually have some machines, but their total always seems smaller than it is because it has to be compared to his. In many cases, leaving out the exceptions, all the men involved are just as equipment conscious as the one with all the machines. They know thay could get more done with more machines. They also know that the work they did accomplish would last longer. Then why don't they have as much equipment as the first outstanding example?

The answer, in many cases, is that they simply don't ask for it, whereas he does. They take what is offered to them, but they have seldom taken the initiative in obtaining it or getting more. When the man next to them gets more machinery than they do, they jump to the frequently erroneous conclusion that he needs it worse than they do or the boss wouldn't have given it to him. This attitude sometimes leads to a disarming complacency in which they, themselves, feel good while, at the same time, they pity the man with "all the power tools to look after."

Therein may lie another reason for the disparity between the "haves" and the "have nots." One can rest assured that the "haves" long ago demonstrated a willingness to keep working any amount of equipment they could lay their hands on. On the contrary, at least some of the "have nots" may at some time have found it something of a chore to look after the power tools they had, and having evaded that chore, now find themselves left in the lurch because someone else willingly accepted it.

When labor allotments are doled out, some of these supervisors insist that they get just as many men as the other fellow. Then, having been given their allotments, they would never once think of letting a single group of these men hang around a toolhouse doing nothing. Instead they would go to no end of trouble to line-up work to keep them busy. On the other hand, look how the "have nots" often handle their machines. First, without a single squawk, they let their neighbor have all the units he can get. Next, they think nothing of letting some of the equipment they do have lie around idle, and make no effort to program its use.

Thus, some of the "have nots" might well remember that, ever since the days of the Conestoga wagon, it has been the "squeaking wheel that gets the grease." However, none must forget that the receipt of equipment, whether asked for or not, also carries with it a responsibility to keep it repaired, to keep it staffed and, above all, to keep it busy.

EQUIPMENT—

Must Be Properly Secured When Unattended

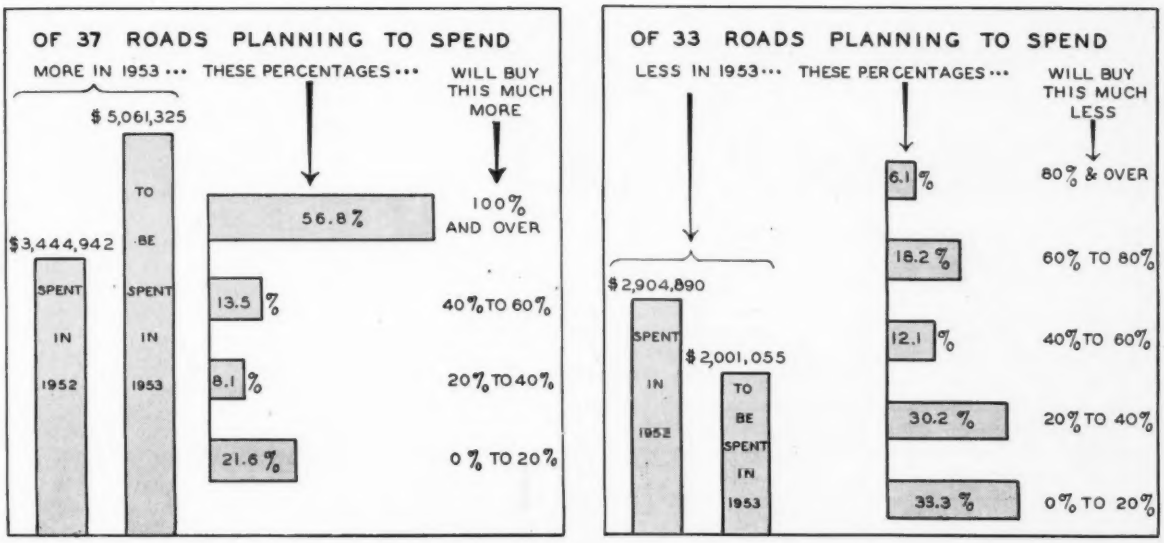
ONE phase of the care of work equipment that needs more attention has to do with the precautions to be taken to assure complete safety when machines are not in use. Most railway rule books contain some instruction to the effect that operators of motor cars must make sure that their machines are locked when unattended. This is sound advice for the treatment of all work equipment. For, in addition to the countless unreported mishaps, more than one train derailment has occurred because of failure to observe this rule.

In one instance, an operator had parked his tractor for a few days on an uphill side slope of an unimproved road that paralleled the railroad. He had shut off the fuel supply before he left the machine and not only had he applied the brakes but he also had secured them with a brake-locking device. As an additional precaution, he left the tractor in low gear with the clutch engaged and wedged a wood block between the foot rest and the brake pedals to hold them in a depressed position. With his machine thus secured, he left feeling certain that it was safely stored until he needed it.

But he overlooked two little details—a vandal could undo what he had done and the tractor was parked on a slope—and, as a result, a passenger train was derailed. Somehow, the tractor came down the slope to rest between two railroad main tracks with its ends fouling a running rail of each track. Marks of the tractor treads showed no indication of retardation by the brakes, so it is apparent that the brakes had been released before the machine was in motion.

We might well ask ourselves what precautions should be taken when leaving a machine overnight and also when leaving it unattended though it is to be used during the same day. Unquestionably, each type of machine will call for different precautionary measures, but have security instructions—not general but specific ones—been prepared for each category of equipment? Or is the security of such machines covered only by general instructions so that precautionary steps are left up to the individual operators?

Each operator will have his own way of securing a machine. He may remove a spark plug to immobilize it, or shove a stake through the wheel spokes, or block the wheels with stones, or cover it with a canvas, or even drain it of fuel. But, with such a large investment as the railroads have in work equipment, it would seem worthy of the interest of top-drawer qualified men to prepare and issue specific instructions on the best practices for the treatment of each type of machine when it is not in service.



With These Patterns of Buying Trends Established by Reporting Roads . . .

Total Equipment Purchases Will Go Up Slightly in 1953

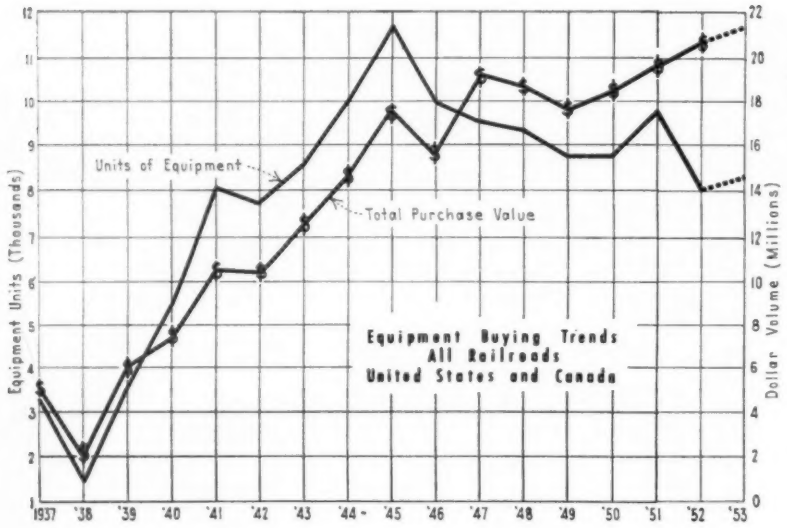
Railways of the United States and Canada expect to spend $21,400,000—more than ever before—to buy 8300 machines and power tools in 1953. With some of this equipment they plan to lay 2,302,000 net tons of rail, install 41,-580,000 ties and raise about 32,500 miles of track on which they will apply 30,500,000 net tons of ballast. M.W.&S. expenditures are also expected to reach a new high—$1,844,000,000

• All signs point to the expectancy that more money will be spent by the railways this year for roadway machines and work equipment than ever before. Most of those signs are, in fact, so strong as to be indisputable. However, when it comes to the question of how many machines such record expenditures will buy, the answer is not quite so clear. Strong forces are acting both to push unit purchases up and to pull them down. An exact evaluation of these forces is almost impossible, but it seems reasonable, at this time, to expect that they will result in relatively low unit purchases, in comparison with the postwar highs. It is not expected, however, that they will be as low as last year.

These conclusions have been reached from the replies received from the chief maintenance officers of a group of representative roads, who were questioned by *Railway Track and Structures* as to how much M/W work equipment and power tools they expect to buy in 1953. Answers were received from 39 officers, most of whom gave details of their anticipated purchases. Twelve of these officers reported that they plan to buy more equipment in 1953 than their plans called for at this time last year. Normally, maintenance officers earmark early in the year fewer machine purchases than they will actually buy before the year is out. Nor do they often indicate in the spring that they plan to buy as many units of equipment as they bought the year before. Contrary to this normal trend, the present plans of seven roads contemplate the purchase of more machines this year than they actually purchased in 1952. Offsetting these factors tending to indicate that purchases will be larger in 1953 than in the last year, 17 officers stated that their planned purchases are smaller than they were last year at this time. Following a middle of the road policy, two officers reported that they plan to buy the same number of units as they did in 1952. Of the 39 officers replying to our inquiry, 35, representing 165,700 miles of line, reported that they planned to purchase at least 2,726 units of equipment in 1953.

From such specific replies, supported by conclusions based on the number of machines purchased by the railways in recent years, it is estimated that all the railways of the United States and Canada will buy a least 8,300 units of work equipment in 1953. This estimate of the volume of purchases for 1953 compares with 8,000 units bought in 1952, with 9,700 units purchased in 1951 and with 8,700 purchased in each of the two preceding years.

In reporting, late last year, the amount of equipment purchased by the end of 1952, a large number of roads gave actual figures as to the total cost of their purchases. On the basis of an average unit cost, derived from these figures, it is estimated that the 8,300 units to be


Units of Equipment
Total Purchase Value
Equipment Buying Trends
All Railroads
United States and Canada
Equipment Units (Thousands)
Dollar Volume (Millions)
1937 '38 '39 '40 '41 '42 '43 '44 '45 '46 '47 '48 '49 '50 '51 '52 '53

bought in 1953 will cost about $21,400,000—another new high in money spent for M/W equipment. Of the 72 roads giving cost details, 37 expected to make more extensive purchases of work equipment than in 1952, whereas 33 planned to spend less. Specifically, the larger group, which spent only $3,444,942 last year plans to spend $5,061,325 in 1953. As can be seen from one of the charts at the beginning of this article, most of the roads in this group—56.8 per cent—plan to spend more than twice as much as they did in 1952, and a number of them plan to buy from three to eight times as much.

In contrast, 33 roads which spent $2,904,890 in 1952, plan to spend only $2,001,055 in 1953. The other chart at the beginning of this article shows that the largest group—one third—of these roads are planning to spend only from 0 to 20 per cent less than they did last year.

Probably on of the greatest influences tending to force the purchase of work equipment upward in 1953 is the generally larger programs planned for the coming year in nearly all maintenance categories. On the basis of reports received by this magazine from representative engineering officers, it is estimated that these programs will include the laying of about 2,302,000 net tons of rail, the installation of 41,580,000 crossties, the application of about 30,500,000 net tons of ballast and the out-of-face surfacing of 32,500 miles of track. To complete such ambitious programs all the roads in the United States and Canada will probably spend a record total of about $1,844 million for all maintenance work.

This estimate of overall expenditures is based on specific information provided by 39 representative roads. For instance, 33 of these roads, representing 144,943 miles of line, reported that they planned to spend $1,015,829,425 in 1953 on maintenance-of-way work. This figure compares with the $975,941,002 these same roads spent in 1952. Of the 33 roads giving this specific information, 22 reported that they would spend more in 1953 than last year, 9 expect to spend less and two indicated that they are going to spend the same as in 1952.

More Surfacing Planned

On the basis of these reports, no category of maintenance work will receive more active attention in 1953 than will out-of-face surfacing. A total of 36 roads, representing 160,350 miles of road and 184,540 miles of main track, report that they will raise 22,921 miles of track this year, whereas they only raised 20,298 miles last year. These figures are especially significant when it is noted that, reporting on their anticipated programs at this time last year, 37 roads said they planned to raise only a little more than 18,000 miles of track. It should also be of interest to note that the amount of track programmed for raising this year places these roads on an average 8-yr. raising cycle.

To supplement their raising programs, 36 roads report that they will apply 21,366,696 net tons of ballast. This compares with the 19,190,015 tons applied last year. The amount of ballast to be applied during the year would undoubtedly have been higher had not 15 of the roads planned to clean considerably more ballast than in the last several years. These roads report that they plan to clean 7,494 miles of intertrack and 5,256 miles of border during the year, whereas they only cleaned 4,770 miles of intertrack and 4,368 miles of border in 1952. Coincident with their raising and ballasting work, 21 roads will crib 2,127 miles of track in 1953 whereas they cleaned the cribs in only 2,084 miles last year. This too, will be a factor in holding down the amount of new ballast applied. It is obvious that such large maintenance programs would be impossible of accomplishment unless all categories of roadway machines and work equipment receive intensive use throughout the year.

With the roadway forces planning such an active campaign this year, it is hardly to be expected that the bridge and building men will not be keeping pace with them. However, the picture of increased activities that are so evident in the track department is not quite so clear on the bridge and building side. In fact, according to 34 chief engineers, only slightly more bridge work is planned for 1953 and slightly less building work than during 1952. Specifically, these men expect to spend $35,414,189 on bridge maintenance in 1952 whereas they spent $34,986,414 in 1952. On the other hand they expect to spend only $60,012,100 in 1953 for the maintenance of buildings in comparison to the $60,491,276 they spent last year.

The big programs scheduled for both the track and bridge and building departments comprise, collectively, one of the major factors pointing to larger equipment purchases during the year. Such programs could hardly be consummated economically without the use of large numbers of up-to-date, efficient machines. Another factor pointing to an intensified interest of maintenance officers in roadway machines, is the relatively large number of new types of equipment being offered by the manufacturers this year or planned for presentation before fall. Most of these units are designed to fill specific existing needs to accomplish more work at less cost while at the same time taking some, if not all, of the drudgery out of it. Even quick previews of some of those new machines soon ready for the market have stirred up considerable interest and presage a demand for them that will surely figure heavily in the final tally of the total number of machines bought during the year.

C. J. GEYER
President, A.R.E.A.

Fifty-second Annual

A.R.E.A. Convention

Palmer House, Chicago

• For the convenience of those who plan to attend the A.R.E.A. convention, the complete program is presented below. As in the past, a large number of addresses are included in the program, the majority of which are to be presented in conjunction with committee reports.

An outstanding feature of the meeting will be an address by Dr. Francis Gaines, president, Washington and Lee University, which will be delivered at the annual luncheon on Wednesday, March 18. The subject: "Hand and Spirit."

As in the past, reports of committees on related subjects have been grouped together in such a manner that members can attend all of those presentations which are most closely allied to their interests.

TUESDAY, MARCH 17

Opening Session—9:45 to 12:15
Grand Ballroom

Address by C. G. Geyer, President
Report of N. D. Howard, Secretary
Report of A. B. Hillman, Treasurer
Greetings from the Signal Section, A.A.R., R. W. Troth
Greetings from the Electrical Section, A.A.R., C. A. Williamson, Chairman
Address by J. H. Aydelott, vice-president, Operations and Maintenance Department, A.A.R. on "Planning Is Always in Season"
Address by G. M. Magee, director of engineering research, Engineering division, A.A.R.—"Research Review"
Reports of Committees on
- Yards and Terminals
- Economics of Railway Location and Operation
  - Address by Dr. L. K. Sillcox, vice-chairman of board, New York Air Brake Co., on "Improved Transit Time for Freight Shipments"

Afternoon Session—2:00 to 4:45
Grand Ballroom

Reports of Committees on
- Waterway and Harbors
- Highways
- Cooperative Relations With Universities
  - Address by O. W. Eshbach, dean, Northwestern Technological Institute, on "The Manpower Situation"
- Contact Forms
  - Address by W. R. Swatosh, assistant to superintendent of construction, Erie, on "Two Essentials of Engineering Science—Mathematics and Agreement"
- Records and Accounts
- Water, Oil and Sanitation Services

WEDNESDAY, MARCH 18

Morning Session—9:00 to 12:00
Red Lacquer Room

Reports of Committees on
- Wood Bridges and Trestles
- Clearances
- Waterproofing
  - Address by J. B. Blackburn, research engineer, Engineering Experiment Station, Purdue University, on "Tests on Waterproofing Coatings for Concrete Surfaces"
- Impact and Bridge Stresses
- Masonry
  - Address by W. J. Eney, head of Department of Civil Engineering and Mechanics, Lehigh University, on "Repeated Loading Tests on Prestressed Concrete Beams"
- Iron and Steel Structures

Association Luncheon—12 Noon
Grand Ballroom

Address by Dr. Francis Gaines, president, Washington and Lee University, on "Hand and Spirit"

Afternoon Session—2:30 to 5:15
Red Lacquer Room

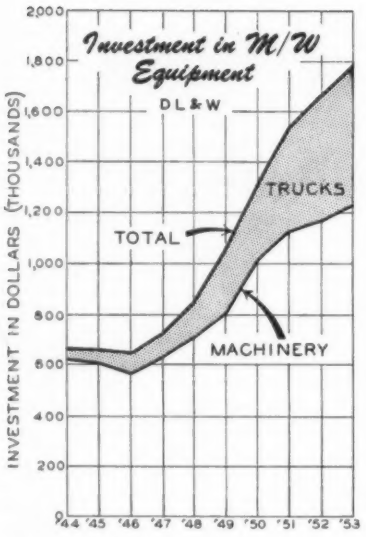
Reports of Committees on
- Wood Preservation
  - Address by Dr. Walter Buehler, technologist, wood preservation, School of Forestry, University of Florida, on "Controversial Issues"
- Buildings
- Maintenance of Way Work Equipment
- Economics of Railway Labor
  - Address by H. E. Kirby, cost engineer, Chesapeake & Ohio, on "Reducing Maintenance Man-Hours"
- Roadway and Ballast
  - Motion picture, "Earthquake Damage and Repairs," with comments by W. M. Jaekle, assistant chief engineer, Southern Pacific

THURSDAY MARCH 19

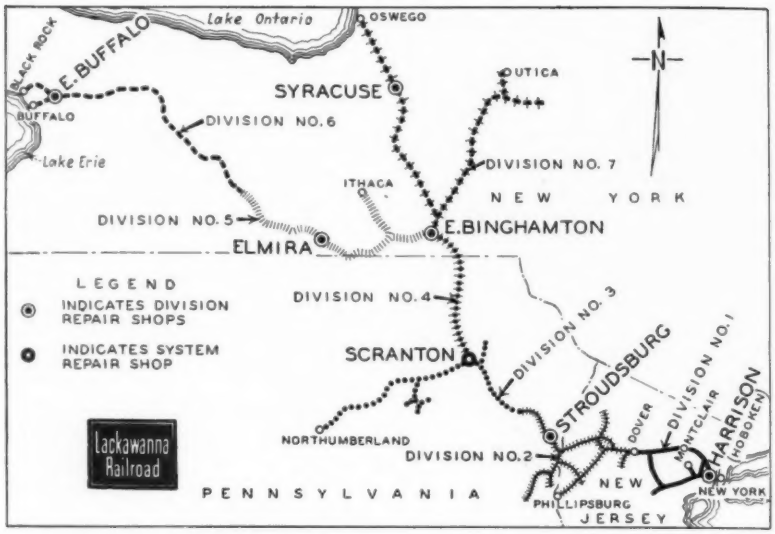
Final Session—9:00 to 12:30
Grand Ballroom

Reports of Committees on
- Ties
  - Address by G. M. Magee, director of engineering research, Engineering Division, A.A.R., on "Progress in A.A.R.—N.L.M.A. Crosstie Research Project"
- Track
  - Address by G. M. Magee, director of engineering research, Engineering Division, A.A.R., on "Prolonging the Life of Ties Through the Use of Pads, Vs. Hold-Down Fastenings"
- Continuous Welded Rail
- Rail
  - Address by Ray McBrian, engineer of standards and research, Denver & Rio Grande, on "Rail Problems in the Moffat Tunnel"
  - Address by R. E. Cramer, special research associate professor, University of Illinois, on "Rail Failures and Shelley Rail Investigation"

Closing Business
Installation of Officers



TRUCKS have accounted for part of the road's increased investment in machines.



HEAVY REPAIRS are made at system shop at Scranton. Light repairs are made by division repairmen each of whom has a shop except on Division No. 3, where system shop is used.

Fight Against "Down Time"...

How the D. L. & W. Keeps Machines

Convinced that the maximum return on its large investment in M/W equipment can be realized only if the machines are kept in good condition, this road maintains an extensive system of personnel and facilities for seeing that all such equipment gets the necessary attention. Main elements of the organization consist of seven repairmen in the field, each with a shop of his own, and a large system repair shop.

• Top engineering and maintenance-of-way officers of the Delaware, Lackawanna & Western are firm believers in the use of work equipment as a means of getting the most out of the maintenance dollar. The degree of their faith in such equipment is reflected by the fact that the road's total investment in M/W machines, including highway trucks, has almost tripled since 1944 (see accompanying chart). An integral part of the Lackawanna's philosophy of mechanization is that, since machine failures in the field can be extremely costly in loss of production and wasted man-hours, everything humanly possible must be done to avoid such failures.

This latter conviction has led the railroad to establish a comprehensive organization designed to give its work equipment the attention it needs—when needed—to assure efficient, trouble-free operation. This organization is comprised of two principal elements, namely, (1) a system of field repairmen, well equipped and carefully trained, who have the responsibility of making frequent inspections of equipment in the field and of making light repairs as necessary: and (2) a modern system shop for making heavy repairs to M/W equipment and for overhauling it periodically. In fact, to keep pace with the needs of its expanding fleet of equipment the road has just completed a new modern structure at Scranton, Pa., to house its system repair shop.

Direct supervision over the Lackawanna's work equipment repair organization has for a number of years been vested in an officer with the title of Supervisor Work Equipment and Welding. Effective January 1, 1953, and reflecting a growing appreciation on the railroad of the importance of this position, the title was changed to Engineer of Equipment and Design.

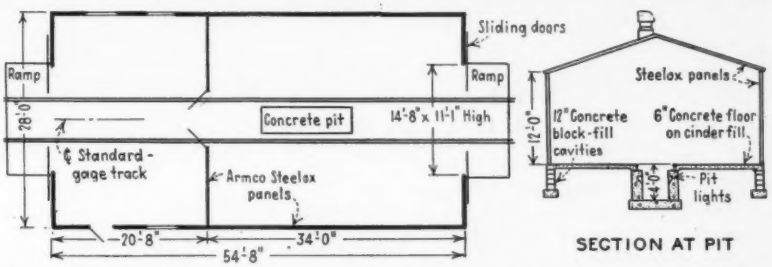
Has Seven Field Repairmen

Keystone of the Lackawanna's field organization for repairing work equipment are its field repairmen, one of whom is assigned to each of the road's seven divisions. These are highly trained employees who must be capable of making light repairs to any of the multitudinous types of equipment owned by the railroad's M/W department. With one exception, each repairman has a shop of his own, which is usually located in an existing enginehouse or shop building.

However, on Division No. 1, where the repair point is located at Harrison (Hoboken), N. J., the repairman has recently been provided with a shop, especially designed and built for his use, which consists of an Armco Steelox building with a concrete floor and greas-

FIELD repairmen must be familiar with all the equipment in their territories.

A NEW SHOP was provided for the division field repairman at Harrison (Hoboken), N. J. Shops of some of the other division field men are located in existing shop buildings. Lean-to at left is not part of the new shop but is used for storage.



THE NEW HARRISON SHOP was especially designed for its purpose and includes a greasing pit, a track built into the concrete floor, and approach ramps.

Running

ing pit. On Division No. 3 the repairman does not have a separate shop, but this is only because he is so located that he has access, when necessary, to the system shop at Scranton. Among other things, the accompanying map shows the location of the repairman's shop on each of the other six divisions of the railroad.

Tools for Repairmen

Each of the division repairmen is adequately supplied with the tools and equipment necessary in servicing and making running repairs to the machines and tools under his jurisdiction, which consists not only of M/W equipment, but also that used by the bridge and building, water service, and signal and electrical forces. The tools and equipment normally supplied to each of the repairmen consists of valve grinding and repairing machines, a battery charger, electric drills, a hydraulic jack, an overhead crane or chain hoist, a bench grinder, a pressure lubricating outfit, and possibly an assortment of air tools, such as impact wrenches.

Each repairman also carries a supply of spare parts, such as coils, distributors, timer points, condensers, spark plugs, clutch facings, carburetor parts, generators, generator brushes, etc. Supplies of these and other less frequently needed parts are maintained at the system shop at Scranton. When a repairman needs a part he doesn't have, he telephones the system shop which puts the part on a passenger train so that the repairman will have it the next morning. Parts not kept in stock can usually be obtained locally, in which event they can be procured immediately, and the repairmen will have them just as quickly. This policy assures that inventories of spare parts will be kept to a minimum, while at the same time repair parts will always be available when needed.

Repairmen Use Power Wagons

It is recognized on the Lackawanna that each repairman must be provided with a means of getting to any point on his territory with the greatest dispatch; and that he must be able to carry with him an optimum supply of tools, equipment, and spare parts. To meet the need for this kind of transportation the road began in 1949 to furnish its division repairmen with especially equipped 1-ton Dodge Power Wagons.

The Power Wagons, as fitted for use on the Lackawanna, are actually mobile repair shops, with a number of devices added that are such as to put them in the category of multiple-purpose units. In each of them the body incorporates metal cabinets along each side with compartments for carrying spare parts, tools and supplies. Between the cabinets there is ample space for carrying larger assemblies, such as complete engines, and for accommodating an oxy-acetylene cutting and welding outfit. The tailgate is fitted with a vise so that, when lowered, it may be used as a work bench to facilitate field repair work.

Each of the Power Wagons has a compressor which supplies air for the operation of pneumatic tools, for inflating tires, and for operating a pressure greasing outfit. The necessary hose reels, and the greasing outfit, are carried in compartments at the rear end of the body. Also at the rear end is an hydraulic hoist with a swinging jib-type boom by means of which heavy objects, such as engines, can be lifted and transferred to and

Fight Against "Down Time"

from the platform of the truck. At the front end of each Power Wagon is a single-drum winch, operated by a power take-off from the engine. These winches have been found to have a multitude of uses. The front end of each Power Wagon is also fitted with brackets and other necessary members to permit a snow plow to be attached, thereby adding to the versatility of the unit.

Make Periodic Inspections

Among the duties of the repairmen is to make a careful inspection of each piece of equipment every three months. The results of this inspection are noted on a standard form (see illustration), a copy of which is sent to the system shop at Scranton. There each inspection form is examined personally by the engineer of equipment and design. He may do one of two things: mark the form "ok" in green ink, indicating that the particular machine is to remain in service, or make a notation in red indicating that it is to be taken out of service immediately and sent to the system shop for repairs.

M/W machines acquired by the Lackawanna come under the supervision of the engineer of equipment and design as soon as they are delivered. When a new machine is delivered it is sent to the system shop for inspection before being put to work in the field. Each new machine is given a D.L. & W. serial number and is entered in the records of the engineer of equipment and design. Among these records is a book which contains a complete list of the company's M/W equipment. This record gives, for each machine, the D.L. & W. number, the engine number, the name of the manufacturer, the date purchased, and to whom the unit is assigned. A complete card index of all equipment, giving this and additional information concerning each piece of equipment, is also kept.

POWER WAGONS used by field repairmen have a variety of devices, including a rear hoist. Here one of the hoists is being used to lift the engine from a Jeep.

The policy is to send all machines to the shop periodically for overhauling. Those units that are in service more or less all day each day during the working season, such as the large on-track tampers and other units assigned to tie-renewal and surfacing operations, are sent to the shop for overhauling each year. Other machines are overhauled somewhat less frequently depending on the usage they receive. For instance motor cars are overhauled every four years. After a machine has been overhauled it is thoroughly tested

The Delaware, Lackawanna and Western Railroad Company

Inspection and Repair Report of M. W. Machines

Date_____
D.L.& W. M/R Number_____
Type of Machine_____
Model_____
Make_____
Serial Number_____
Division or Department_____
Location of Machine_____
Name of Operator_____
Title_____

CONDITION OF

Engine or Motor_____
Transmission & Differential_____
Ignition & Wiring System_____
Lubrication_____
Fuel System_____
Chassis & Body_____
Couplers & Connecting Pins_____
Insulation_____
Wheels & Axles (Check Gauge)_____
Journals & Bearings_____
Brakes_____
Frictions & Cables (On Cranes)_____
General Appearance & Condition of Machine_____
Is Machine being properly operated, Lubricated & Maintained_____
Should Machine be shopped, if so, when_____
Other defects and repair parts noted, required and/or ordered to be shown on back of report. If parts have been ordered for sometime and not received proper notation shall be included.
Note Instructions on back of Report

Signed_____

LEFT—Form on which field repairmen indicate results of periodic inspections of each unit of equipment. Forms go to engineer of equipment and design for examination.

THIS FORM MUST BE FILLED OUT BY THE MECHANIC WHEN A TRUCK HAS BEEN OVERHAULED AND IS ABOUT TO BE RELEASED FOR ROAD SERVICE

WHEN THE ANSWER IS NO, GIVE A REASON.

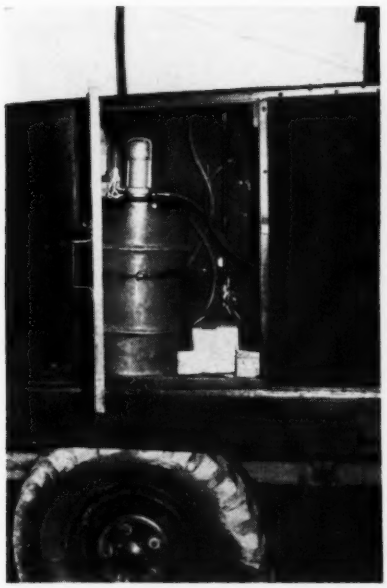
Make of Truck_____ License No._____ Truck No._____

Will both headlights light?_____
High beam_____ Low beam_____ Parking_____
Does horn blow?_____
Is gas gauge working?_____
Is generator working?_____
How many windshield wipers?_____
Do windshield wipers work?_____
Is heater working?_____
How much emergency brake?_____
How much foot brake pedal?_____
Were brakes relined?_____ If not, why?_____
Does clutch slip?_____
Is windshield broken or cracked?_____
Are any windows broken or cracked?_____
Is hand throttle in working order?_____
Are clearance lights working?_____ L.S._____ R.S._____
Does tail light work?_____
Is stop light working_____
Are cluster lights working front?_____ Rear_____
Are reflectors cracked or broken?_____ L.S._____ R.S._____
How far did you run for a road test?_____
Did engine stop during road test?_____
Does engine start hard?_____
Is speedometer working?_____
What is speedometer reading?_____
Is instrument panel light working?_____
Are all four turn signals working?_____
Is muffler or exhaust pipe leaking?_____
Did you balance wheels?_____
Did you check wheels for line?_____
Did you put a number plate on?_____
Did you check owners card number?_____
How many license plates on this truck?_____

State what work was done on body:

Date_____ 19_____ Signed_____ Mechanic

RIGHT—Trucks that have been overhauled at the system shop must be inspected and the results noted on this form before they can be released for road service.



SUPPLIES, tools and spare parts are carried in cabinets of repair trucks.

A COMPRESSOR mounted in each of the field repair trucks provides air for inflating tires, for operating pneumatic tools, and for a pressure greasing outfit.

before being released from the shop. The repairman making the test fills out a form similar to that used to report the results of field inspections. This form must show that the machine is in satisfactory condition before it is released from the shop.

As indicated by the article immediately following, the Lackawanna's new system shop at Scranton is modern and fully equipped. The permanent staff in the shop consists of a foreman, 10 repairmen, and 3 other employees for general service work.

History of System Shop

The expansion of the Lackawanna's work equipment repair organization has paralleled the upward curve representing its investment in such equipment. Originally the road had a shop at Dover, N. J., for making repairs to motor cars and other equipment used by the M/W forces. At that time (prior to 1936) there were only three permanent mechanics in the shop, who spent most of their time repairing motor cars. The road also had a full-time man who had the responsibility of keeping its ballast Moles in good repair. At that early date the Lackawanna already had six division repairmen. The practice then was for these men to work in the shop at Dover during the winter, where their time was spent repairing equipment from their respective territories.

In 1947 a system shop under the supervision of the M/W department was established at Scranton. The shop was installed in a building formerly used by the mechanical department, and remained there until transferred to the new building on February 15, 1953.

Experience With Lube Oil

The experience on the Lackawanna has been that, where the responsibility for repairs is in the hands of enterprising supervision, many ways can be found to increase the effectiveness and economy of work equipment. The road's experience with lubrication provides an example of what can be accomplished along this line. Formerly the practice was to change the engine oil in each machine after 40 hr. of operation. For highway trucks the interval between oil changes was 1500 miles. After considerable study and experimentation, and with the objective of lengthening the intervals between oil changes, the road standardized on the use of what they considered the best oil available, and started the practice of installing oil filters in all engines. Another new policy, started at about the same time, was to send a sample of oil from each machine to the laboratory for analysis after each 40 hr. of operation. It was found that, with the grade of oil being used and using filters, the intervals between oil changes could be greatly extended. In fact one type of machine is now being operated an average of 700 hr. between oil changes. The practice now is to change the oil only when the periodic tests indicate that this is necessary.

On the Lackawanna the effectiveness of its system and organization for repairing M/W equipment is measured by the amount of time a machine is out of service because of mechanical trouble. A daily report on the "down time" of all the larger machines is sent to the chief engineer. These reports show that in 1952 the road's two Jackson Multiple Tampers worked a total of 1910 hr. with a combined down time of only 6 hr. Down-time records of other types of M/W machines are equally impressive.

All phases of the repair and operation of work equipment on the road are under the general supervision of G. A. Phillips, Chief Engineer, and the Engineer Maintenance of Way*, which position was held by John P. Hiltz, Jr., until February 1, when he became Chief Engineer, Maintenance, of the New York Central System. Bernard Geier is Engineer of Equipment and Design. In addition to having direct supervision over the system repair shop and the repairmen, Mr. Geier has responsibilities in connection with the purchase of new machines and in designing new types of machines that are not already available.

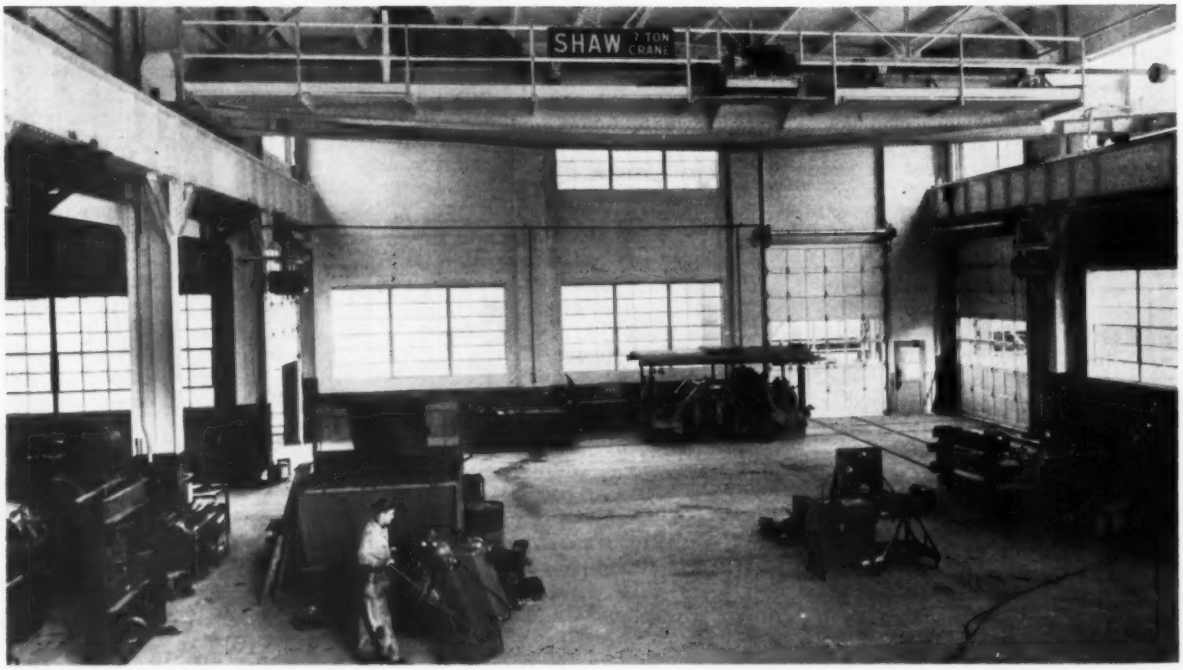
* As reported in the news columns of this issue, Robert F. Bush has been appointed engineer maintenance of way and B. L. Beier becomes engineer maintenance of structures.

How D. L. & W. Fights "Down Time". . .

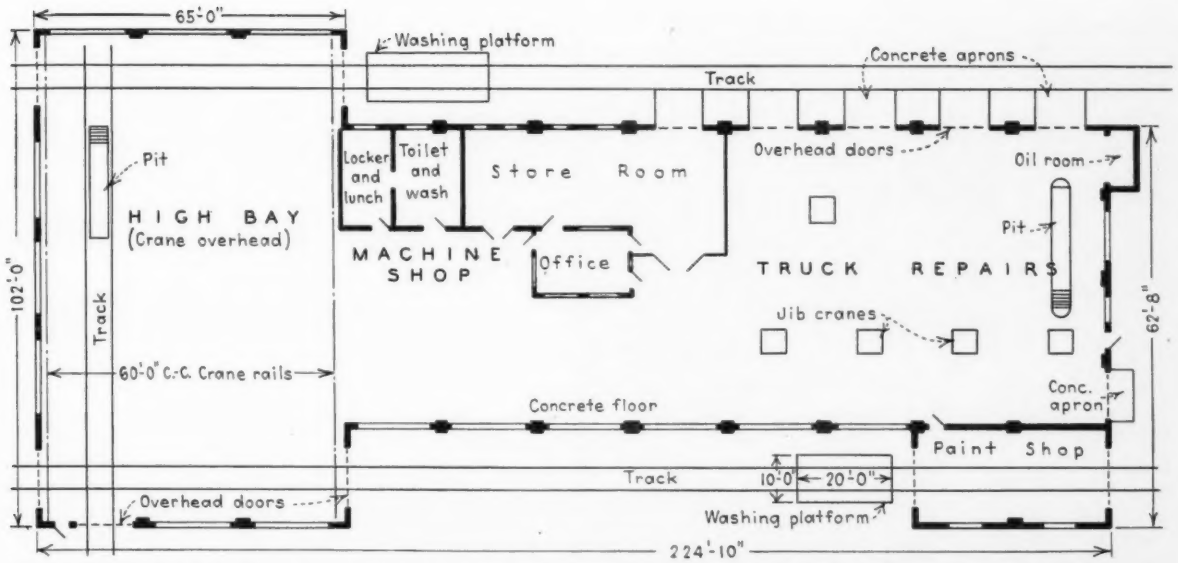
BERNARD GEIER is engineer of equipment and design.

Opens New System Shop

These views and the plan show the new shop that the Lackawanna has built at Scranton, Pa., for making heavy repairs to its work equipment. Previously this shop had been housed in another building at Scranton.



ARRANGEMENT in the high bay (see plan) is such that on-track units can be routed through it in production-line fashion.



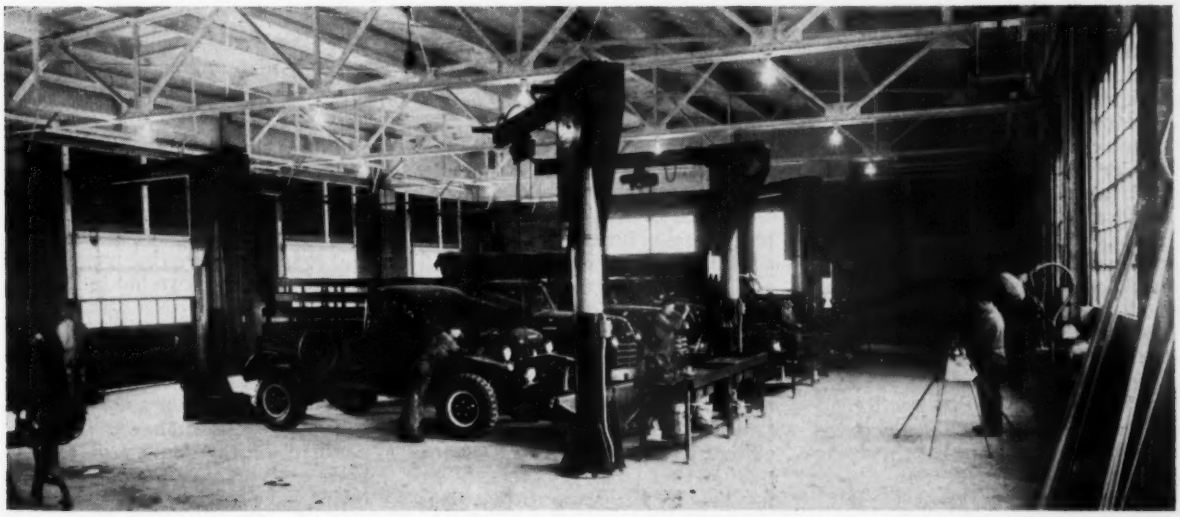
T-SHAPED, the shop is laid out to secure maximum efficiency. Note central location of machine shop, office and storeroom.

Also arrangement that allows units to be washed before entering and painted after leaving. Shop was completed last month.

at Scranton

RIGHT—The machine shop is fully equipped with all necessary tools. Note the overhead system of mono-rail hoists for handling the heavier parts and assemblies. From his office in enclosure at right the engineer of equipment and design can see most areas of the shop. The building is of concrete, brick and steel construction.

BELOW—A series of doors in one wall of the building permits trucks to enter and leave it with a minimum of maneuvering. Operations are facilitated in this section by a number of jib cranes. Large window areas on all sides of the structure assure ample daylight illumination. Shop is centrally located on railroad.



TIME STUDIES
A Key to Organization Increased Output for

By L. W. Howard
Valuation Engineer, Illinois Central
Chicago

For a number of years the Committee on Records and Accounts of the American Railway Engineering Association, under its assignment to study the use of statistics in railway engineering, has been investigating the application of time studies to track-maintenance operations. Mr. Howard, a former track maintenance officer, has been actively working on this subcommittee assignment.

• Time studies of work methods have been a major factor in the development of efficient organizations in modern industry. Furthermore, such studies have contributed materially to increased manpower productivity and the usefulness of machines. Many times in recent years the methods employed by track-maintenance forces equipped with mechanical devices have been likened to those employed in the assembly lines of modern heavy industry. The comparison is appropriate in many ways but more study should be given the subject in an effort to determine more precisely the degree of similarity between such widely different types of work.

Webster defines "Assembly line" as a "grouping of machines, equipment and workers so that the work passes from operation to operation in direct line until the product is assembled." The maintenance man will immediately recognize that a group of machines performing any track-maintenance operation can be made to fit into Webster's definition by merely changing the definition so that it will read a "grouping of machines, equipment and workers so that they pass over the work, performing operation to operation in direct line until the work is completed."

In the modern industrial assembly line, labor forces performing work operations are grouped in such a manner that the rate of movement from operation to operation is steady and continuous, so that the starting and completion times of work performed are on a uniform, smooth-flowing basis. Similarly, it is desirable to have track-maintenance forces so organized that their group operations will be continuous and their productive results reasonably uniform.

Exact Information Needed

Most track-gang organizations with which roadway machines are used are organized according to the judgment and the experience of the responsible supervisory officer. Some of the factors which enter into the development of such organizations are labor-force availability, labor-force allowance, and the productive capacity of each machine as far as such productivity is known by judgment and the experience of the supervisor. All of these factors are of great importance; however, if the maintenance officers in charge had exact information as to the performance capacities of the various machines, and were then able to group those machines in the gang to be operated at a selected near-uniform rate of speed, much would be accomplished toward the attainment of maximum speed and efficiency of the entire combination of men and machines.

In the organization of a rail-renewal gang the track-maintenance supervisor knows the number of men required to operate each of the machines used. He also knows that there are certain operations which must be performed by hand labor, such as removing old bond wires and rail anchors, throwing out old material and placing certain items of new material, etc. In addition, he knows that the full usefulness of the machines cannot be realized without extra manual assistance. For instance, a spike puller will not pull all spikes or a wrench will not remove all bolts, and it is necessary that some manual labor be employed to follow the machines to pull spikes that may be left or broken, cut off bolts which cannot be wrenched, etc. Therefore the use of information as to machine-output as a guide in gang organization is not wholly independent of the factors of experience and judgment of the track-maintenance officer who must de-

and a Tool for M/W Machines

cide the number and distribution of extra men, equipped with proper tools, to catch up loose ends, and who must also organize his particular machine-equipped gang to fit the economical situation.

Making a Time Study

The purpose of a time study is to determine the productive capacity of a group of workmen or a machine performing a specific part of the whole job, with the objective of using the knowledge gained to determine a desired relationship between each of the various individual work operations and the whole job.

The first step in making a time study of a complete work operation is the subdivision of the whole job into the groups of workers or machine groups performing individual operations. Each operation can then be individually studied under operational conditions to obtain the productive results. In the early work of developing methods for recording time-study data we were of the opinion that a single report, listing all individual work operations, could be kept on a day basis, using the day's productive result for determination of the units of work performed. The results of such studies were unsatisfactory because delays originally thought immaterial, but later found to be very important, were omitted. Furthermore, the data obtained were unrefined and difficult to take, and it took too long to secure a sufficient volume of information for satisfactory mathematical calculations of productive results.

Our efforts, therefore, more recently have been directed toward development of a method whereby a large volume of data for productivity calculations can be taken in one day. To take such data requires a continuous study of an individual worker group or machine operation by a checker who records the time the worker group or machine enters each successive rail length of work, the number of men performing the work during each rail length, and the number of units of work performed. For example: To study the productive results of a spike-pulling machine, he records the time the machine starts operation on a rail length and the time it starts operation on the next rail length, deducting from that time any delay, and noting the number of ties in the rail length and the men operating the machine.

The data in the field should be taken by experienced checkers who are informed as to the desired result. It should be taken from observation of the work of a gang organized on a judgment basis to operate as smoothly as possible. It is preferable that data for each individual operation be taken at one time through use of a group of checkers sufficiently large to check the individual operations simultaneously. In the event it is impracticable to employ a large force of checkers no particular harm to the study will result if the data on the individual operations are taken at different times. The first check of work-operation productivity, which will be used as the basis for an initial gang reorganization will, in all probability, produce greater productive results in some of the operations. Additional checks and reorganizations will then be required until the performance standards desired are established.

Organization of the Gang

Upon completion of the productive-result studies for each of the individual work operations, a theoretical organization should be set up, making use of the productive results obtained, with the addition of the necessary men to perform operations not done by machines, or to catch up loose-end work left by the machines. A rate of movement should be chosen as a production goal; in the case of a rail-relay gang the crane would be the most logical machine about which to build the gang organization. The rate of movement desired will naturally affect the size of the gang and number of machines required, and the choice of the production rate should be governed by the availability of labor force or machines, or the amount of money alloted for the labor force.

When the production goal has been decided upon, sufficient machines or groups of workers of sufficient size for each individual operation, as developed from the productivity studies, should be provided; for example, if one power wrench will remove bolts from 36 joints per hour, and one other power wrench will tighten bolts at the rate of 24 joints per hour, the unbolting and bolting operations moving at a chosen rate of 72 joints or rail lengths per hour will require two machines for unbolting and three machines for bolting.

The theoretical gang developed should be put to work, and its performance studied in the field in the same manner as the original gang as organized on a judgment basis, and any reorganization indicated to be necessary as a result of such further study should be made. This continuing procedure of organization, study, and reorganization, followed by more study, must be continued until the desired performance standard is reached. When proper performance standards for the individual operations are finally developed, rates of movement for any similar gang can be varied to fit economic or traffic conditions, and local labor availability.

There are certain limitations in the use of time studies as a practical basis for organization of maintenance gangs, but such limitations are not insurmountable. The judgment and experience of maintenance supervisory officers can be used to overcome factors which the time-study method cannot recognize or evaluate. Also, when using time studies to measure efficiency, and to develop data on speed of work, due consideration should be given to safety and the quality of the work.

The principal use of time studies should be to standardize practices of gang organization and machine assignment. When work is properly organized with a minimum of labor force to produce the desired result production will be increased, and quality work should be a natural result. There is great need for the establishment of standardized practices in maintenance-of-way work, and this writer is of the opinion that time studies are not only the key which opens the door to the determination of improved methods of gang organization, but are also a tool that may be used to increase the output of available machines, to obtain better methods of handling materials, and to encourage the development of more and better roadway machines.

Please turn the page for an example which illustrates, step-by-step, the application of these principles.

TIME STUDIES (Continued)

Method of Making Them for Rail Relay Organization

• A hypothetical organization of a rail-relay gang is shown in the accompanying table, which is based on theoretical time-study results of observations of a gang organized on the basis of judgment. The first step in making the determination of the organization required is the breakdown of the work force into the individual operations which comprise the whole. Twenty-eight operations were considered necessary to perform this relay work, excepting bond wire installation. The number of men required for 17 of the operations is, in this instance, determined on the basis of the judgment of the supervisor. Such operations have been marked in Column 2 of the table with a letter J, and the number of men required for those operations or per machine to be studied are shown in the third column. Those operations handled by machines and which were time-studied for productive capacities are marked in Column 2 with a letter M and those operations handled by manual labor, which also were studied for productive results, are marked H.

For the purpose of this example a productive rate of 75 rails per hour was chosen for this hypothetical organization. The unit of material handled by the spike pullers is the number of spikes per rail length; by the bolting machines the number of bolts to be removed or tightened per rail length; by the crib lowering machines the number of cribs per rail; and by the spike machines the number of spikes per rail length less the number of spikes driven by the gage and joint spikers. It is not necessary to make a productive study of the adzing because the number of adzers required is determined by the supervisor.

The rail crane need not be studied because it is the machine about which the gang is organized, and the productive rate chosen should not exceed the crane's capacity to perform work. The creosote-application machine need not be studied because its rate of movement can always surpass that of the crane.

The units of material handled in the operations to be done manually were determined as follows: Throwing out removed scrap is based on the number of removed spikes, bolts, and rail anchors per rail length; setting and driving tie plugs is based on the number of spikes per rail; the placement of new tie plates and straightening of tie plates under the new rail are based on the number of tie plates per rail length; the cleaning and lubrication of rail ends is considered as one joint per rail length; and the installation of bolts prior to tightening is based on the number of bolts per joint. The gage spiking was figured on the basis of four groups of gage spikers applying spikes every sixth tie. (All units of work calculated for the studies are based on 24 ties per 39-ft. rail length.)

The productive rate of each machine or hand operation is determined by field check of the individual operation over many rail lengths of work performed by the gang organized on the judgment basis. The results of the time studies of the individual groups are indicated in Columns 7 (units per machine-hour) and 8 (units per man-hour). Column 9 (the number of machines required) is derived by dividing Column 6 (the number of productive units required for the chosen rate of production per hour) by Column 7 (the units produced per machine-hour).

The figures in Column 10, which give the number of men required for each of the operations in the hypothetical best organization, are determined as follows: The number of men shown in Column 3 on lines preceded by the letter J in Column 2 are carried direct to Column 10. The number of men shown in Column 3 preceded by the letter M are the number of men needed to operate each machine studied and, to produce the number in Column 10, must be multiplied by the number of machines required (Column 9). The number of men needed for each of the hand operations studied (letter H) are derived by dividing the figure in Column 6 (the units per hour at the chosen rate) by that in Column 8 (units produced per manhour).

The organization initially studied should then be reorganized on the basis indicated in Column 10, and additional productive studies should be made of those operations marked (M) and (H) and others, if desired or indicated, until the best organization is obtained.

Time studies will reveal different production rates for the same machines working on different materials. For example spikes for 90-lb. rail will be pulled at a faster rate than spikes ½ in. longer for 115-lb. rail. In work paced by machines there is usually developed an incentive for following labor groups to keep up with the organization ahead. Time studies will not recognize this human characteristic in machine or hand labor, and, for that reason, should always be made of the best machine work and best organized labor groups.

Development of Organization to Relay Rail at Rate of 75 Rails per Hour

Work Operations	2(a)	Men required	Units of Work	Units per rail	Units per hour (75 rails per hour)	Units per machine-hour	Units-per man-hour	Machines required	Organization required
1		3	4	5	6	7	8	9	10
Flagman	J	2							2
Throw new plates into track	J	2							2
Cut bond wires, remove anchors	J	2							2
Spike pullers, (machine)	M	3	Spike	48	3600	1550		3	9
Remove spikes left by machine	J	1							1
Unbolting machine	M	1	Bolt	4	300	220		2	2
Cutting torch (bolt removal)	J	1							1
Remove joint bars	J	1							1
Line out old rail	J	2							2
Throw out old tie plates	J	2							2
Throw out removed scrap	H		(c)	62	4650		1400		4
Lower ballast in cribs	M	3	Crib	24	1800	1500		2	6
Drive down spike stubs	J	1							1
Set and drive tie plugs	H		Tie Plug	48	3600		620		6
Adze ties (3 machines)	J	3							3
Creosote adzed surfaces	J	2							2
Place new tie plates	H		Tie Plate	24	1800		480		4
Set in new rail	J	4							4
Grind adze bits (b)	J	2							2
Clean and lubricate rail ends	H		Joint	1	75		22		4
Put in bolts	H		Bolt	6	450		138		3
Tighten bolts	M	2	Bolt	6	450	155		3	6
Straighten tie plates	H		Tie Plate	24	1800		312		6
Gage spiking	J	13							13
Machine spiking	M	3	Spike (d)	36	2700	680		4	13(e)
Apply rail anchors	J	5							5
Spike joints	J	2							2
Water boys as needed	J								
							Total		108

(a) In this column J indicates number of men determined on basis of judgment; M indicates machine operations on which time studies to be made; H indicates hand or manual operations to be studies.

(b) 1 man to carry re-tooled heads and assist operators in head renewals

(c) Removed spikes, bolts and rail anchors

(d) Total spikes per rail length less 8 installed by gagers and 4 installed at joints

(e) Add 1 man to distribute spikes to machine

A TRUCK CRANE is used widely by the Chicago, South Shore & South Bend for its maintenance work, including rail laying.

ANOTHER SHORT LINE, the Alton & Southern, depends heavily on this crane because of its mobility and many work uses.

Short Lines Are Mechanizing Too

Can mechanized equipment be used profitably by the smaller railroads with only limited amounts of maintenance-of-way work to be done? What special problems are involved in the use of machines on such lines? How are they being solved? These and many other questions are answered in this article which is based on information obtained from short lines ranging in size from 11 to 101 miles of road.

• Railroads large enough to require maintenance programs of sufficient size to keep men and machines busy on the same work for most of each season have a simple problem of mechanization as compared with smaller railroads where the amount of each kind of work may be extremely limited. Nevertheless, prompted by the higher hourly wages prevailing today, plus the availability of types of machines that can be used for various purposes, the smaller roads are looking with increasing favor on the use of machines for carrying out maintenance-of-way and structure work.

These are general conclusions that may be drawn from the results of a survey to determine the specific mechanization problems and practices of the smaller railroads. This survey was conducted by means of a questionnaire which elicited answers from 15 companies. With one exception, all of these companies reported that they had mechanized their maintenance-of-way and structure work in some degree, and all gave more or less detailed information regarding the amount and types of machines being used, the degree to which purchases have been influenced by increasing wage rates, the practices being followed in connection with the acquisition and use of machines, and how these roads are dealing with the problems peculiar to the mechanization of the smaller lines.

For the purpose of this survey, it was decided, arbitrarily, to class as small lines those having not more than about 100 miles of road. The 15 lines submitting answers to the questionnaire had mileages of road ranging from 11 to 101. Even though it is possible, from a statistical standpoint, to consider lines within this range of mileage as being in a single category, actually the problems and practices of mechanization vary widely within the group, not only because of differences in mileage but also because of variations in other factors, such as traffic, revenues, and differences in the mileages of sidings and yard tracks. For instance, one road in the group surveyed, located in a rural area, has 46 miles of road, all single track, and only a limited amount of siding and yard tracks, while another line, in a large city, has 38 miles of road, all multiple track, and a total of nearly 300 miles of trackage. It is only to be expected that the problems of mechanization on two such lines, even though both may be classified as small railroads, would be radically different. However, the results of the survey show that the differences are largely in degree only, with all railroads in the group showing a surprising unanimity of opinion on most of the questions which were asked.

On the 14 roads reporting the use of mechanized equipment, the investment in such equipment ranged from $2,400 to $350,000. The extent to which circumstances can influence the degree of mechanization is shown by the fact that one railroad with 36 miles of road has an investment in M/W machines of only $7,500 whereas another line, with 34 miles of road, but a relatively large mileage of other tracks, has an investment in such equipment of $88,500.

Many Types Of Equipment Owned

As for the types of equipment owned by the small lines, the returns to the questionnaire indicated an amazingly wide range, all the way from the smallest hand-held power drills and saws to locomotive cranes, spreaders, crawler shovels, other types of grading equipment, and large on-track tampers. Admittedly, very few of the small lines participating in the survey own these larger units of equipment, and, as to be expected, most of them show a distinct preference for the types of machines that are adaptable to various types of maintenance work.

This latter fact was brought out in answers to a question inquiring if there were any multiple-purpose ma-

ELECTRIC TIE TAMPERS are preferred by some short lines as they can be adapted to the operation of other electric tools.

PORTABLE COMPRESSORS also are power units that allow a wide range of application by both track and b.&b. forces.

A & S FINDS that this motor grader is a multilpurpose machine that can be used for grading, ditching and road maintenance.

Short Lines Are Mechanizing Too—

chines that had been found particularly suitable and economical for use by short lines. Only one road answered this question in the negative. The others named different types of multiple-purpose equipment that they had found particularly useful. The units most commonly mentioned in this connection included tie-tamping outfits, both electric and air operated, crawler and wheel-type tractors and bulldozers, highway trucks and rail-laying cranes.

Versatile Machines Preferred

According to the answers to the questionnaire, the compressors and generators used with tie-tamping outfits are popular with small railroads because the power plants can be used for the operation of other types of tools, and in the case of the electric generator it can also be used to furnish power for emergency lighting. Various railroads mentioned the versatility of tractors of various types. The replies indicated that crawler tractors are used widely by these small roads for ditching, grading, drainage, flood control and other maintenance activities during the summer and snow removal during the winter.

One road is impressed by the flexibility of wheel-type tractors, which it uses for grading, weed mowing, handling material of construction jobs, snow removal, and loading stone and cinders on dump trucks. Another line finds that wheel-type tractors produce a saving in mowing the right of way and in grading or leveling driveways and material yards. A railroad operating in a large city has three wheel-type tractors, two of the industrial type and one of the farm type, which it has found "to be very useful." These units, equipped with front-end loaders, are used for snow removal, light grading, loading, etc. Other types of multiple-purpose machines that are meeting with favor on short lines include derrick cars, power shovels, truck-cranes, weed burners (used as snow melters in the winter), motor graders, and tractor-compressors.

Effect of Higher Wages

Nine of the reporting railroads answered in the affirmative a question regarding whether increased wage rates had caused them to purchase types of machines that previously they had felt could not be operated economically. One of the roads that answered "no" to this question went on to say that the "decision to purchase power tools was based on a number of factors, one of which, of course, was increased wages." Another road that gave a negative answer to this question said that increasing labor costs have had an indirect effect on decisions to buy labor-saving equipment. The types of tools and equipment that have been purchased as a direct result of higher wages include large on-track tampers; other types of tie-tamping equipment; snow removal and track-cleaning equipment; weed-control machines, including spray cars, weed burners and mowers; rail saws; bolting machines; power shovels and cranes; and various types of small power tools.

The survey developed the fact that small railroads buy power equipment for the same primary reason as the larger companies, namely, to save money. But this is not the only reason. More than half of those answering the questionnaire indicated that they had important secondary reasons for buying M/W machines. The better quality of the work done, the saving in time, the ability to do more and better work with the same

THE FARM-TYPE TRACTOR impresses some small roads since there are attachments available for handling grading, mowing and snow removal

FAIRMONT'S DERRICK CAR was applied differently by one road when it was assigned to help in laying rail.

force, the reduction in personal injuries—all these were cited as having a bearing in the purchase of power equipment.

The engineer maintenance of way and structures of an electrified line explained that, in addition to the potential savings involved, his company considered two other factors when contemplating the purchase of work equipment, namely, "will it do the job to suit our needs, and can we keep the machines going during the working season?" He explained that, because of his road's high density of traffic and the location of the pole line for the overhead system, the first mentioned of these considerations is probably the primary one. The question on his road is: "Can the machine do a complete job so that we can eliminate hand labor, or do we have to do half the work by hand?"

How Repairs Are Made

The survey indicated that maintenance officers on the small railroads have a keen appreciation of the need for making adequate provision for keeping M/W machines in good working order. Many of them make it a point, in one way or another, to have each machine inspected more or less periodically. Because of the relatively small quantities of equipment involved, it is not expected that many small railroads would have specially equipped shops for making repairs to their maintenance machines. In fact, of those replying to the questionnaire, only three have repair shops for their equipment that are under the supervision of the M/W department. On 10 of them, repair work on maintenance machines is done by the mechanical department. On one of the lines reporting, the practice is to farm out the repair work to garages and other agencies.

Some Machines Rented

Because of the relatively limited amount of maintenance work to be done on small railroads it is to be expected that the practice would be more or less prevalent on such lines of renting equipment for some types of work. However, the survey shows that this practice is not by any means universal. Only six of those reporting said that they rent equipment for routine maintenance. For the most part the equipment acquired by this method is confined to the larger units, such as ditchers, dump cars, draglines and spreaders.

As might be expected, the practice of renting equipment for emergency use is much more general than acquiring it in this manner for routine operations. Nine of the roads replying to the questionnaire said that, on occasion, they did not hesitate to rent equipment to carry out emergency jobs. The units most frequently mentioned in this connection include wrecking cranes, pile drivers, snowfighting equipment, and heavy earth-moving machines.

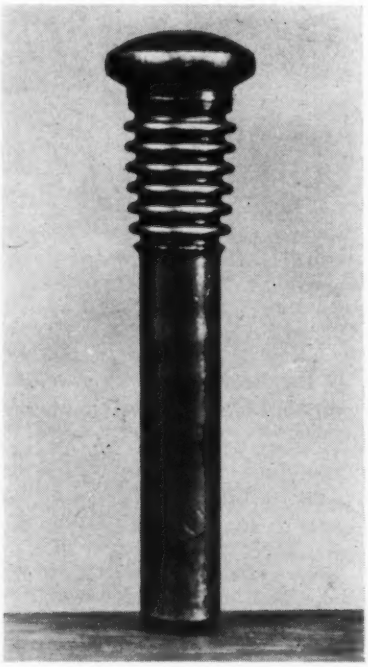
The replies indicate that most small railroads recognize that, in programming maintenance-of-way and structures work, special attention must be given the problem of keeping multiple-purpose machines busy as much of the time as possible. The thinking in this respect of the majority of those replying is summed up in the words of one chief engineer who said "It is a matter of planning work so the equipment can be used at different times by various gangs." Another man said this is accomplished by "setting up an M/W program for the year's work during the months of January and February, whereby all section and extra gang work is laid out on a month-to-month basis using the M/W equipment."

Obtaining the Larger Machines

Most of those replying to the questionnaire were in agreement on the point that the smaller railroads simply do not have sufficient work to keep the larger machines in operation enough of the time to produce an adequate return on the investment. A number of suggestions were made for overcoming this problem. One man suggested that "two or more railroads, situated close to one another, could, in some cases, work out a plan for joint use or joint ownership of the equipment they cannot afford individually; or the smaller railroads might be able to rent for short periods equipment that is owned by the larger railroads." Another was that small lines could purchase the equipment with the intention of renting it out part of the time.

Still another suggested plan for making machines available to the smaller railroads would be for a private company to rent out the various types of machines so that they could be scheduled for use on small lines on a basis similar to that used for rail-testing equipment. The man making this suggestion said that the machinery thus offered should be in the form of complete outfits for the economical performance of the various operations, and that the renting company should furnish the operators. Still another solution, as offered by one of the respondents, would be to have contractors do the general repair work such as surfacing, timbering, ditching and bank widening, with the railroad "just keeping small gangs to do patrol and emergency work."

TIE DRILL as used on the C&EI for drilling two anchor-spike holes simultaneously in ties on opposite sides of the rail. The production model is shown below.



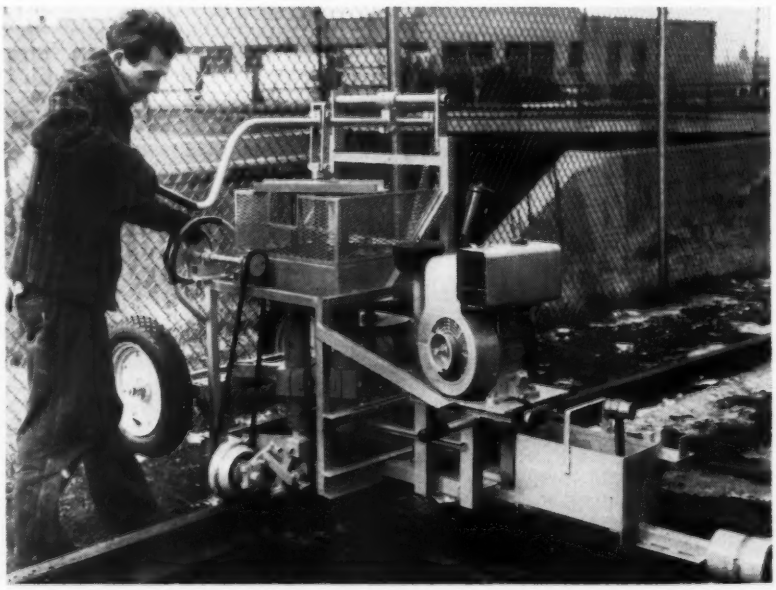
RACOR STUDS have ridged rings which are deformed when driven through the standard anchor-spike holes of tie plates and make the stud and plate almost integral, thus providing strong resistance to tie-plate movement on the tie.

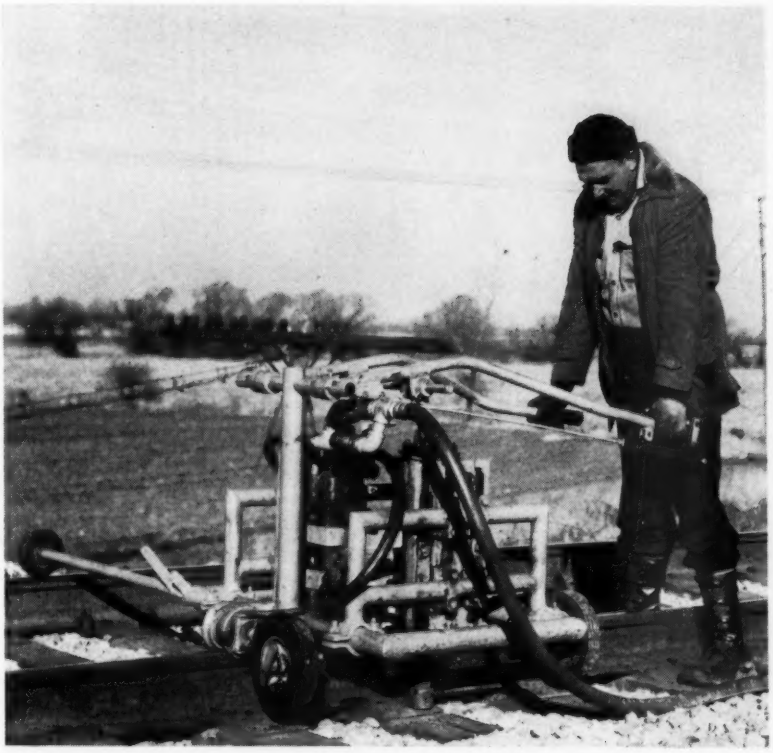
Using Two New Machines . . .

Hold-Down Studs Go in Two at a Time

Production Model of Tie Drill

Pictured here is the production model of the Nordberg Manufacturing Company's Tie Drill. It shows substantial changes and improvements as compared with the pilot model used on the C&EI. The engine has been moved on the frame toward the center of the track to provide easier movement through better weight distribution, a more compact frame has been constructed, and pneumatic setoff wheels have been provided. Like the pilot model the machine bores two holes at one time and its two spindles can be set to drill holes for two rail spikes or for two anchor spikes. The spindles are adjustable for positioning them over the holes of any tie plate, and the drilling is done through the tie-plate holes. The machine is operated by one man who moves and spots it as necessary. It is said that he can drill 48 holes, covering 24 ties per rail length, in 2½ min.





THE STUD-DRIVING RIG consists of two pneumatic hammers so mounted on a carriage that two studs can be driven simultaneously, one on each side of the rail.

Newly developed tie-drilling machine and stud-driving rig are put through experimental trials on the C&EI for installing Racor studs as hold-down fastenings. Twin drills on the drill and twin hammers on the driver are pre-set for positioning tools ovr tie-plate hold-down holes on each side of the rail so that both positions are worked on simultaneously.

• When the Chicago & Eastern Illinois recently laid its first installation of continuous welded rail near Chicago Heights, Ill., it used Racor studs as tie-plate hold-down fastenings. Two new machines were used to install the studs; one, a tie-drilling machine developed by the Nordberg Manufacturing Company, and the other a stud-driving rig devised by Ramapo Ajax Division of American Brake Shoe Company. The fact that each machine is designed to work at two hold-down positions of a tie plate simultaneously was an important factor in speeding up the work and in reducing the cost of installing the studs. It is also reported that uniform results were produced with less operator fatigue.

About 3.3 track miles of 115-lb. continuous welded rail were involved in the relay near Chicago Heights. An Oxweld pressure-welding plant was set up at Danville, Ill., where acetylene generated at the railroad shops was available. The rail was welded in the conventional manner and was transported about 95 miles on cars to the site of installation.

For installing the anchor studs, the tie-drilling machine was used to bore holes slightly smaller in diameter than the studs. This machine, known as the Nordberg Tie Drill, has two spindles which can be pre-set to bore two holes for rail spikes or two holes for anchor spikes simultaneously. For this relay job the spindles were set to drill the two anchor spike holes. The tie-drilling machine used on the C&EI job was the pilot model of this new unit. Since then a production model of the machine has been developed, which incorporates a number of changes and improvements. Details of the production model, along with a photograph of the machine, are given in an adjoining column.

Experience on the C&EI showed that, using the tie-drill, one man can bore holes at an average rate of 1,000 holes per hour. By field drilling the holes, accurate spacing and vertical alinement were obtained with a considerable reduction in the cost of labor.

Behind the boring machine and immediately after the holes were bored, Racor studs were set and driven down with mauls to where the rings contacted the plates. The plates were thus held in proper alinement with the holes until the driving of the studs could be completed by the machine.

In this operation the studs were driven down to a point where generally less than two rings were left above the plate. This depth was considered sufficient to insure a tight bond between the stud and the plate, making them almost integral.

The machine used for driving the studs was operated by one man. It is a track-mounted machine and has two pneumatic hammers for driving two studs simultaneously. The two hammers are set for the anchor-spike-hole punching of the tie plates so that the operator only has to position one of the hammers over a stud, lower the handle bar of the machine, and release the air. Both hammers then drive the studs to the desired depth. The hammers are then raised and the machine is moved to the next plate.

While some revisions were made to this machine during its work on the C&EI it developed rates of 900 studs per hour with one operator. It was found that the machine not only made it possible to drive the studs more economically than would have been possible using individual hammers, but also considerably lessened operator fatigue because of reduced vibration. It is contemplated that further improvements will be made in this machine, which are expected to result in still greater output.

Although this machine was especially designed for driving the Racor studs, it can also be used to drive cut spikes in either the line or anchor positions. It is equipped with two set-off wheels so that it can be removed easily from the track.

ELECTRIC HAMMERS AND HAMMER DRILLS are widely used in the bridge and building field for speeding up drilling and cutting operations in concrete, stone and brick. Typical examples of the hammer drills at work are Syntron's (left) Model 17-RO drilling anchor-spike holes in a concrete floor and (above) Model 10-RO drilling a hole in a tile wall.

ANOTHER APPLICATION for these machines is on tunnel work. Here, a Black & Decker No. 36 Electric Hammer is being used to bore anchor holes for the support of underground pipe lines.

PLACES INACCESSIBLE to the conventional-type drills can be reached only by machines having special application. Here, a Milwaukee Right-Angle Electric Drill reaches a bad location.

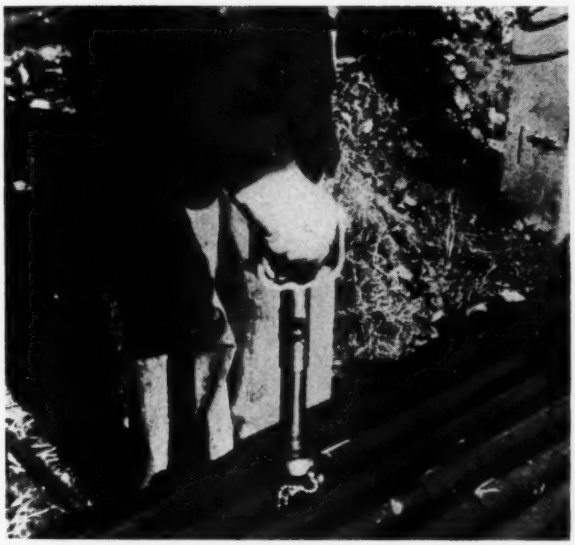
ROUGHENING CONCRETE surface with a bushing tool on a Black & Decker No. 36 Electric Hammer to create a good bond between the old concrete and new cement that is to be applied.

Special Tools for th

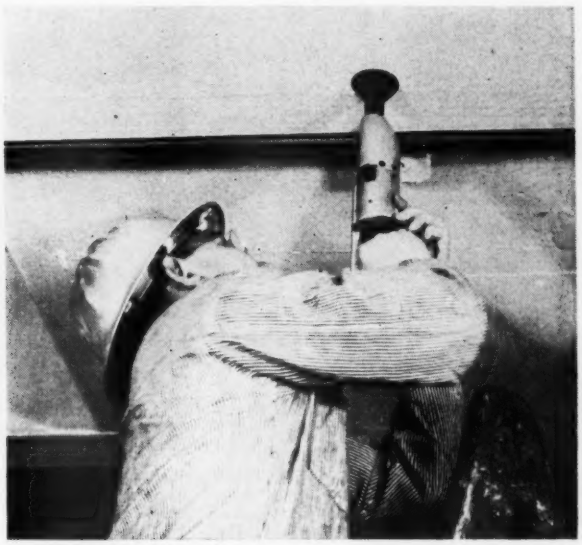
• There is now a power tool or machine available to do practically any kind of job that may be encountered in the construction or repair of bridges and buildings. Many such tools have been commonplace for years. There is nothing new or novel about chain and hand-held circular saws, power drills and augers, concrete breakers, clay spades, riveting hammers, chipping tools, wrenches, paint-spray and sand-blasting equipment, and a host of other tools too numerous to mention here. The bridge and building forces of the railroads have been using such tools in large numbers as a routine matter for many years. They are regarded as

POWDER-ACTUATED TOOLS, although relatively new, have also found a niche in the bridge and building field. Here, a Ramset Jobmaster is being used to install bolt fasteners in concrete.

ANOTHER EXAMPLE of such tools is the new M.S.A. Velocity-Power Portable Punch which is being used here to punch holes for ¾-in. rivets in the flange of a 10-in., 40-lb. H-Beam.



DRIVING A STEEL PIN through a signal pipe and internal core was done in a matter of seconds by this M.S.A. Velocity-Power Interlock Pinner employing a cartridge-and-pin assembly.



VARIOUS FASTENING ASSEMBLIES are available for powder-actuated tools to increase their utility. Here, a plumber is installing pipe hangers overhead with Remington's Stud Driver.

r the Bridge and Building Forces

necessary to the efficiency and effectiveness of these forces.

These more or less conventional tools have been supplemented in recent years by some relative newcomers in this field. Some of these new additions are adaptations or variations of long-established tools. Examples are the right-angle drill and hand-held power saws with blades for cutting materials such as masonry and asbestos-cement sheets. On the other hand some of the more recent additions are entirely new, either in the function performed or in the means used to do the job. In this classification is a hydraulic device for splitting chunks of rock or masonry—a function that could only be performed before, and less safely, by blasting. Somewhat in the same category are powder-actuated tools for use in fastening objects to masonry or metal. Then there are the power-operated reciprocating saws, the power planes, the electric hammers, and many others. The accompanying photographs show a few of them.

Practically all of these special tools have applications in railroad bridge and building work. Many of them have already found their way into this field and are well on the way to being regarded as standard equipment for B.-& B. gangs.

Special B. & B. Tools—

ELECTRIC SANDERS are useful for prepainting preparations, fitting doors, drawers and millwork. Sanding a table top is made easy by this Speedmatic Model 503 Dustless Belt Sander.

POWER SAWS offer almost unlimited possibilities of application to wood, Transite, Masonite, wire or sheet metal. Some, like this Milwaukee Model 414 Sawzal, need no starting hole.

CROSSCUTTING, RIPPING OR NOTCHING timbers, even under water, have been simplified with the advent of special tools such as Wright's Precision Power Saw.

VARIOUS ABRASIVE SAW BLADES are available. Here, a Porter-Cable Red Label blade cuts asbestos-cement siding. Will also cut various composition boards.

CUTTING A DOORWAY through a brick wall with a Porter-Cable Speedmatic electric saw with Green Label Blade. Will cut mortar, tile and even marble.

RODS, WIRE ROPE AND CHAIN, up to a diameter of 1 in., can be cut by two men in 15 seconds by means of Manco's hand hydraulic pump Unit B (left) and Model 20 Guillotine (right).

MOTORIZED BUGGIES, such as Kwik-Mix's Moto-Bug, can be used on all wheelbarrow jobs of hauling and dumping refuse, sand, stone, brick, concrete mixes and other bulk materials.

In Widening Cuts . . .

. . . And Shaping Shoulders . . .

. . . Motor Grader Produces Results Like This in Proving Itself . . .

. . . A Multiple-Purpose Earthmover

In its first year on the Illinois Central's Iowa division, a Caterpillar Model 12 unit has been used effectively for maintenance grading, snow-removal and flood-repair work. For right-of-way grading it is used in conjunction with a front-end loader mounted on an International crawler tractor.

• A surprisingly large amount of right-of-way grading work has been done on the Iowa division of the Illinois Central during the past season by a motor grader, which is a relative newcomer to the growing list of that road's mechanized aids to better maintenance. "When I sent that piece of equipment out to work on widening the first cut, I had high hopes of getting a few of my worst spots remedied before fall," the supervisor of track began when relating how much had been accomplished. "But little did I think," he continued, "that by the end of October I would have widened, on both sides of the track, a total of 25 cuts varying in length from 100 ft. to 500 ft., and in depth from 5 ft. to 15 ft."

He then told of the trouble he had had every winter in keeping his track shimmed through each of these cuts because of poor drainage at one point or another. He told how free water had flowed from the center of one of the cuts in the spring in such volume as to cause small slides which blocked the ditch. The water would then flow across the track to the other ditch, scouring the ballast and softening the roadbed. Under these conditions the foreman had to smooth the track frequently in spring and about four times a year afterward.

Being one of the worst spots, this was the first to feel the blade of the motor grader. When the job was done, the ditch had been moved about 10 ft. farther from the track and had been deepened an average of two feet. Drainage was so improved that the free flow of water soon stopped and no seasonal trouble is anticipated. Each cut slope had also been peeled back about 10 ft. and graded to a flatter angle. Finally, between the new ditch and the ballast, a gently sloping shoulder had been built on which a mower with a 6-ft. sickle bar can now be operated.

Right after the grading in this cut was completed about the middle of April, the track foreman smoothed up the rough spots through the cut. Between that time and the end of October, when the work was inspected

STARTING at the top, the motor grader plows material into successive windrows until big enough to be pushed to the end.

AT THE END of the cut the waste material is leveled into depressions or used to widen shoulders or strengthen fills.

SHOULDERS are built up by rolling suitable surplus material toward the track until wide enough then shaping them to suit.

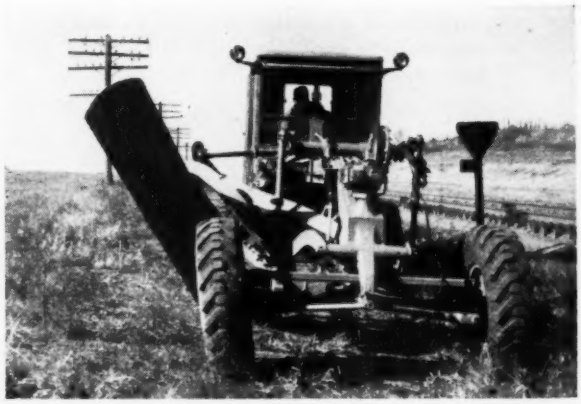
by a reporter, no further work was required. This compares with the four smoothings required every year prior to last spring's grading operations. At every other location where grading has been completed, comparable results have been obtained as measured by the fewer smoothings that are now necessary.

How Work Was Done

Soon after beginning the use of a motor grader for cut-widening work, the operator quickly worked out a technique of his own which varied somewhat in accordance with the height and length of the cut. Generally, he found that to start work at the top of the cut was more effective and less expensive than to begin at any other point. In this procedure, he would begin at the right-of-way fence, working the material toward the track. When he had peeled off a windrow large enough to warrant it, he would "square-up" his blade and "bulldoze" the material into the depressions at the ends of the cut. Where his judgment would indicate this operation was unnecessary, he would continue to roll the windrow toward the track, ultimately "bulldozing" it out of the ditch with his squared-up, 12-ft. blade. Finally, after innumerable passes had been made, always in small bites, what had once been a steep cut slope that dropped into a narrow, shallow ditch had become a gentle slope rising from a wider, deeper ditch farther from the track. Waste material produced in this work was used to strengthen the shoulders of the cut.

This method was reversed, to some extent, under two conditions. First, in those few cases in which the base of the original cut was extremely close to the track—too close to accommodate any material rolling from the top of the cut—the blade of the grader was turned as much toward the vertical as necessary and used in this position to shave the base of the cut back far enough to hold waste material skimmed from the top of the cut. Then, alternating between the top and bottom of the cut, the motor grader quickly finished shaving the cut. Under the second condition, in which the cuts were shallow and the slopes not very steep, the whole job was done entirely from bottom to top.

One especially long cut, definitely earmarked for a bottom beginning, offered an opportunity for teamwork between the motor grader and other equipment—some of it untried in this type of work. The length of the cut exceeded the distance which it was felt that a motor grader could push dirt economically, especially when some of it might have to be pushed more than once.



BLADE can also be set to cut slopes as steep as 90 deg. It is used in this position to start work at the base of cuts.

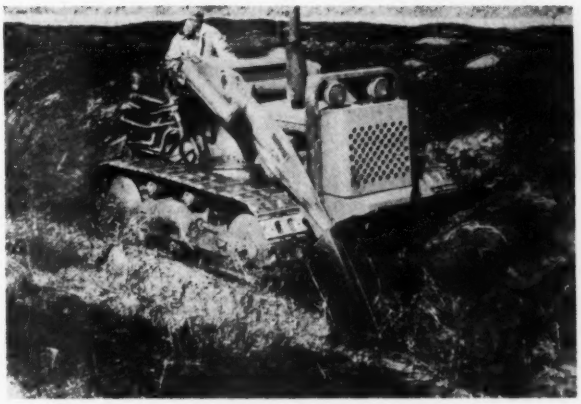
What was the solution? In the first place, a bottom beginning was made with the motor grader, and the cut widened enough to permit the use of a Pettibone-Mulliken Trak Kleener at the foot of the slope, while the motor grader was shifted to the top of the cut. After that, the Trak Kleener moved along, picking up the loose material rolled down by the motor grader, and loading it into trucks which carried it to the nearest fill where it was dumped for use as widening material.

During this and all other cut-grading operations on the Iowa division, the motor grader was also teamed with a companion earthmover—an International-Harvester crawler tractor equipped with a Hough front-end loader. While the motor grader was shaving the cut slopes to tonsorial excellence, the tractor-loader unit was opening up the ends of culverts, cleaning the cross ditches and doing similar auxiliary work. This unit was found to be especially valuable for removing dirt from the ends of pipe culverts under highways at grade crossings and in grading in the close quarters near telephone poles, power lines and around guy wires. When duties of this nature did not claim its entire attention, the loader was used, sometimes as a bulldozer, in foot-of-slope work otherwise performed by the motor grader.

In getting from one job to another not contiguous to it, the motor grader ran on highways, whereas the tractor was loaded on a flat car for movement by train. However, where the terrain would permit, the tractor, on relatively short moves, sometimes ran under its own power along the right of way.

In the first ten months of use, the motor grader assigned to the Iowa division not only graded 25 cuts on each side of the track in less than six months, but spent about two months on flood-repair duty; leveled cinders on 18 miles of branchline track; leveled station grounds in the vicinity of six towns, and did clean-up work in large yards at Waterloo, Iowa, and Cedar Rapids. It also got a small taste of snow duty near the end of the winter. Brief as it was, this work marked the grader as an effective tool for clearing snow and ice from crossings, streets, driveways, parking areas and depot platforms. As the supervisor of track remarked in summing up his winter plans for the grader: "When that machine can accomplish as much in making one 'swipe' at the snow on a station platform as 25 men can handle in a whole hour, one would hardly expect me to let it hibernate. It is too useful to stand idle."

The use of this equipment was under the general direction of N. R. Hill, division engineer and was supervised directly by F. L. Stiner, supervisor of track.



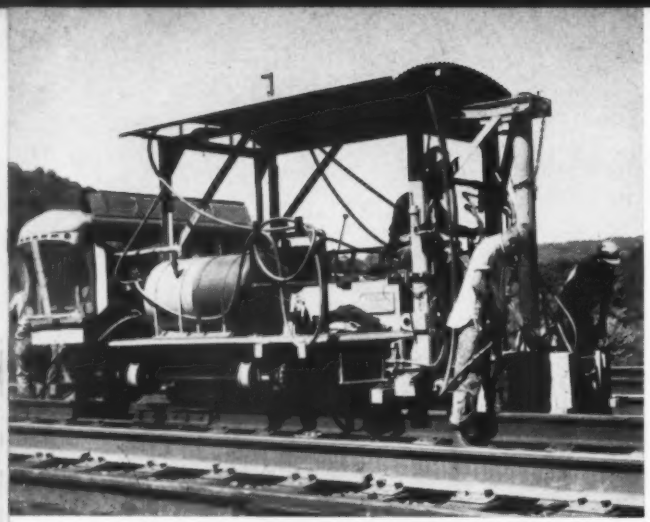
FRONT-END LOADER comprised the other member of the two-unit grading team, being especially useful in close quarters.

AUXILIARY work handled by the tractor-loader included the preliminary base-of-cut work more often done by the grader.

BOTTOM STARTS are made on low cuts or others in which the base is too close to accommodate material rolled from top.

DEEPER DITCHES were generally cut first by the tractor, progressively bulldozing the material to the end of the cut.

March of Machines



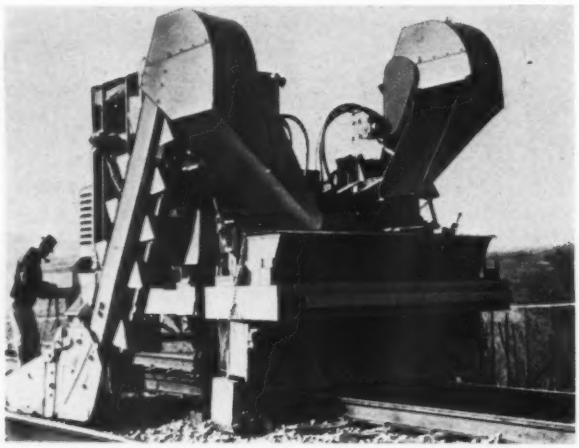
A TIE spacer-nipper-spiker, self-propelled and combining all machinery necessary to space the tie, hold it firmly against the base of rail, and spike it. Machine has electro-magnetic type brakes and a hydraulically-operated spacing head which may be preset to desired intervals. *Pullman-Standard Car Manufacturing Company*

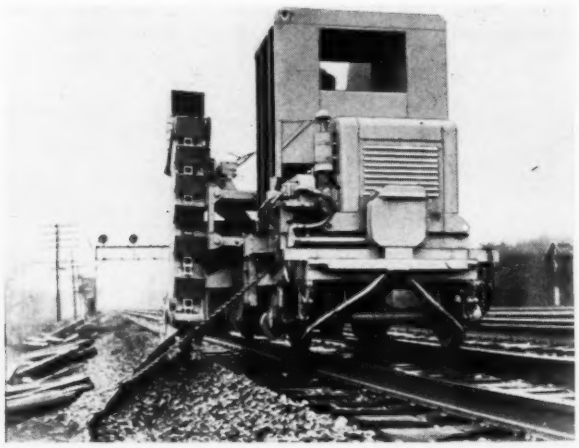
Presented in these pages is a brief and graphic summary of many of the new and improved machines, power tools and devices for use by the maintenance-of-way departments of the railroads, which have been described in this publication during the past year. For additional information on any of the products described on these pages, the reader is invited to make use of the postcards which can be found on pages 291 and 292 of this issue.

A POWER ballast cleaner which works in conjunction with a separate winch car that tows the ballast cleaning unit by means of a cable. The cleaner unit is designed to pick up dirty ballast from both shoulders of the track, clean it, and redeposit it on the track at a rate of from 1,000 to 1,250 ft. per hr. It will dig out shoulder ballast to a depth of from 8 to 10 in., depending upon whether the ties are 8 ft. 6 in., or 9 ft. in length. *Pullman-Standard Car Manufacturing Company*

• In keeping with the Equipment Economies theme that keynotes this entire issue, no greater service could be rendered our readers than to refresh their minds in regard to the many new and improved machines, power tools and devices introduced by the manufacturers during the last 12 months, which are designed to make railway maintenance work easier, safer and more economical. Accordingly, *Railway Track and Structures*, in these three pages, reviews briefly and graphically, some of the new equipment which has been described in greater detail in the issues from April 1952 to February 1953, inclusive.

During this period, the number of new and improved machines introduced was in keeping with the high rate of activity that has been in evidence for the past several years. In studying the March of





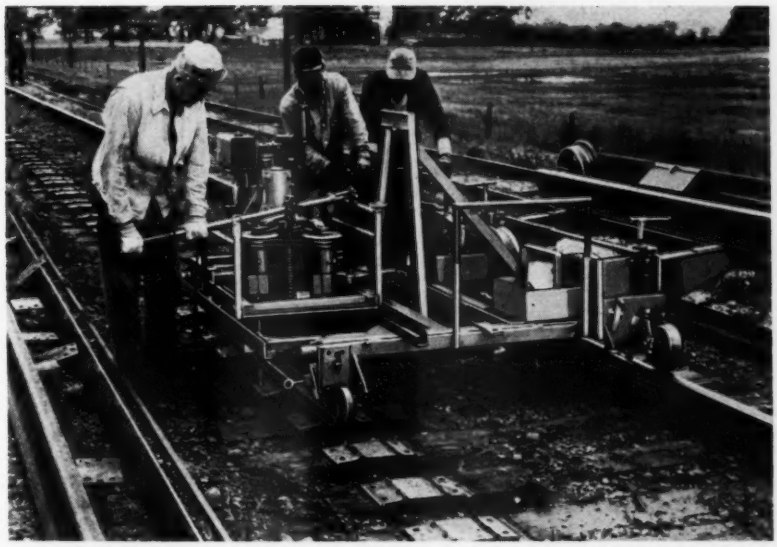
A TRACK-MOUNTED ballast distributor for placing ballast in position for tamping is shown in the above two photographs. Called the McWilliams Ballast Distributor, the self-propelled machine is operated by one man and picks up ballast from the intertrack space or shoulders by means of two bucket conveyors on either side of the machine. It then deposits the ballast in the correct position for tamping—both inside and outside the rail. Amount of ballast picked up is controlled by raising and lowering conveyors. Operates at speed of from 800 to 1,000 ft. per hr. *Railway Maintenance Corporation*

– A Review

Machines the reader will note that units for use in several of the various phases of railway maintenance are included. Thus, we see evidence of the manufacturers' efforts to anticipate needs in all types of work and then to construct machines that will fill these needs satisfactorily. In design the equipment incorporates the latest ideas in engineering and technology to increase service life and efficiency, and to reduce maintenance and operating costs. The evolution of many of the machines described herein can be attributed to the efforts of both the manufacturers and the members of the A.R.E.A. Committee on Maintenance of Way Work Equipment. To these groups the railroad industry owes a debt of gratitude.

Because of space limitations and in the interest of conserving readers' time, the presentations have been limited to pictures and brief captions. Due to lack of space, it has been impossible to present all of the deserving products introduced during the past year.

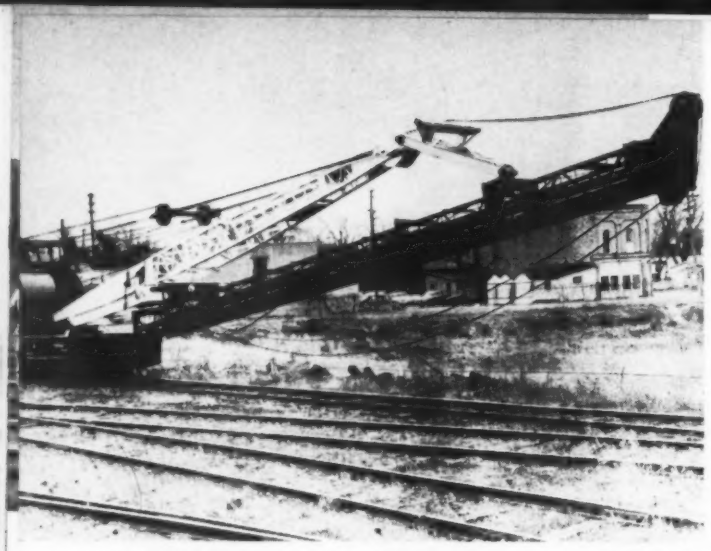
As further evidence that the manufacturers are continuing their efforts to fulfill the needs of the railroads for new and better equipment, readers need only glance at the Products of Manufacturers section of this issue, in which many additional devices are described.



THE DUN-RITE track gaging machine automatically positions tie plates by means of a runner shoe which glides between the shoulders of the plate while the main weight of the machine is borne by wheels which run along the opposite rail of the track. The improved model shown here is also equipped with engine-driven drills for boring the anchor spike holes in the ties. ***Nordberg Manufacturing Company***

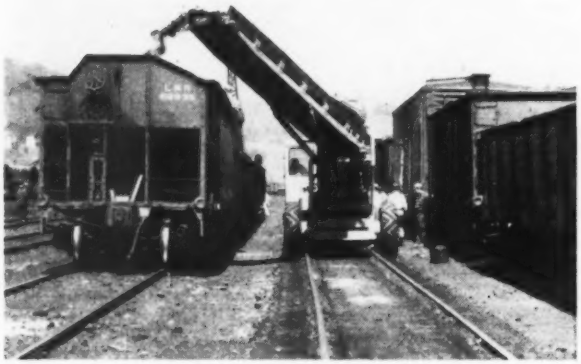
ABOVE—The Power Bolt Tightener, said to be able to tighten from 200 to 300 joints per day, is equipped with two socket wrenches for tightening nuts on each side of the rail. Instantly reversible, the wrenches are driven through a chain drive, gear box, and power torque clutch by a Wisconsin air-cooled gasoline engine. Uniform tightness is assured by an automatic torque release lever and set-off wheels permit quick track clearance. ***Woolery Machine Company***

LEFT—Portable spike-driving machine is mounted on roller bearings and is easily pushed along the track by one man. Engine, compressor and air tank are mounted on the unit which also has a platform for transporting kegs of spikes. Power hammer is carried in special holder. The unit is pushed along the track by a handle which, when released, automatically sets brakes on two of the wheels to keep the machine from "drifting." ***Woolery Machine Company***



ABOVE—Shown in its folded position is a new folding pile driver leader designed for application to the manufacturer's line of diesel-electric locomotive cranes. The leader features automatic folding into the clearance position and power folding so that the leader can be placed on a car and disconnected for transport. *Industrial Brownhoist Corporation*

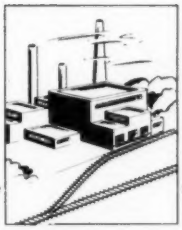
ABOVE—Another view of the folding pile driver leader showing it in driving position. It can be arranged to provide for either manual or power battering and can accommodate standard pile hammers of various sizes. The crane's electric traction motors can be easily disengaged when it is desired to include the units in trains. *Industrial Brownhoist Corporation*



ABOVE—The HiLoader Track Cleaner is equipped with an auger-type gather feeder to speed up yard and right-of-way cleaning. Its adjustable conveyor will dispose of gathered material into hopper cars at a rate of 10 cu. yd. per min. The machine runs on extra-wide tread pneumatic tires and is equipped with flanged guide wheels to keep the front end aligned over the track. The unit will clean both the track and the intertrack space to the full length of the ties. *Athey Products Corp.*

RIGHT—The Mixall combines an aggregate dryer with a twin-shaft pugmill mixer to handle maintenance and patching work with either hot or cold bituminous mixes or concrete. The machine has a 3-cu. ft. capacity and the ability to produce up to 5 tons of hot mix or 10 tons of cold mix per hour. Mounted on two pneumatic-tired wheels, the unit weighs 6,650 lb., and is powered by a 22-hp. gasoline engine. The skip is equipped with an automatic top limit throw-out. *Barber-Greene Company*

For additional information on any of the products described on these pages, use postcards, page 291.



PRODUCTS OF MANUFACTURERS . . .

. . . new, improved equipment, materials, devices

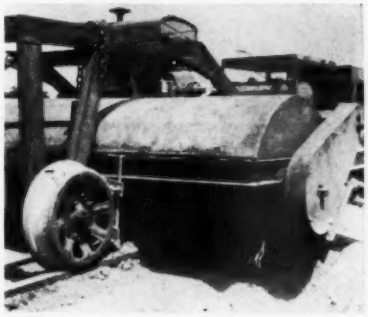
IMPROVED GRADALL

SEVERAL improvements have been incorporated in the design and construction of the earthmoving machine known as the Gradall, according to its manufacturer, The Warner & Swasey Co., Cleveland, Ohio. A better distribution of the load with respect to the frame has been made so that the unit is said to be tip-proof without the need for outriggers. Also, the carrier's wheel base has been shortened 18 per cent to provide greater maneuverability. The manufacturer states that the carrier's chassis weight of 12,550 lb. is the heaviest ever to be used for Gradall mounting.

The engine used in the new undercarriage is a 427-cu. in. L-head unit developing 140 hp. at 2800 r.p.m. An oversize radiator is used to insure ample cooling even when runing at high ambient temperatures. Also, a 13-in. vibration-dampened clutch is incorporated in the design.

Available for the first time as an optional accessory is a remote-control carrier-drive system so that one-man operation of the Gradall is possible. By means of push-buttons in the upper cab, the operator may actuate a pneumatic-electrical control system which gives him complete control of the carrier. The motor may be started and stopped and the unit may be driven forward or backward and steered right or left, so that the operator may spot his carrier as the work proceeds.

Kershaw's Track Broom will pick up all excess ballast behind a surfacing gang and discharge it in windrows on each side.



The unit is equipped with a steel brush which picks up the material.

TRACK BROOM

A NEW machine, designated the Track Broom, has been developed by the Kershaw Manufacturing Company, Montgomery, Ala., primarily as a companion unit to the company's Ballast Plow and Regulator behind which it will remove all loose excess ballast left behind a surfacing gang. It can also be used for yard-cleaning purposes. This machine is a self-propelled on-track unit powered by a four-cylinder 24 hp. air-cooled gasoline engine. It is equipped with a steel brush which is used to sweep ballast or dirt up on a two-way conveyor. The conveyor discharges on both sides, with half of the picked-up material going to each side.

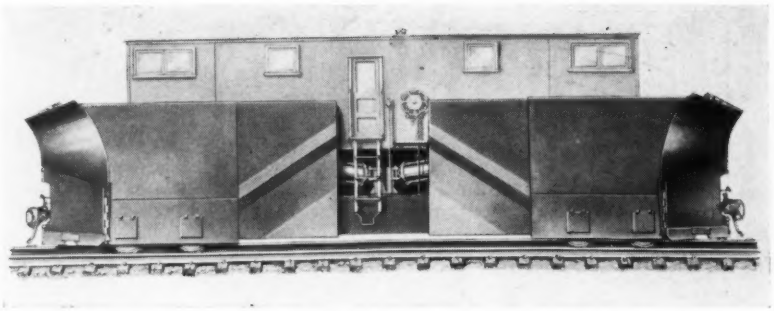
When used with Kershaw's Ballast Plow and Regulator, the Track Broom, it is said, will completely dress track. When used for yard-cleaning purposes, the Track Broom removes the material from between the rails and from the ends of the ties and places it in windrows between the tracks. A front-end loader is then used between tracks to load the material onto trucks for disposal. The Track Broom weighs about 6,000 lb. and has a capacity of from 800 to 1,000 ft. an hour.

For additional information on any of the products described on these pages, use postcards, page 291.

IMPROVED HAYCO TRACK LINING SCOPE

THE Brice Hayes Company, Chicago, has announced a number of improvements incorporated in the latest, Model C, Hayco track lining scope. The welded steel base with which previous models were

equipped has been replaced in the new design by a heat-treated cast aluminum base said to give greater strength plus lightness and non-corrosion qualities not available with steel. The staff is protected with a patented "Electro-film" plating, which is said to be non-rusting and does not require lubrication. A new-type non-glare rear-view mirror is now standard equipment on the scope, and is furnished complete with sunshade. A newly designed carrying case of varnished outdoor non-warping plywood, equipped with a lock and especially designed for compactness, is supplied with each scope. Other improvements made to the scope include an improved friction bearing, a newly designed telescope arm, new rubber telescope extenders, a brass restraining chain, and a newly designed vernier adjustment.



DOUBLE-ENDED SNOW PLOW

RECENTLY announced by the O. F. Jordan Company, East Chicago, Ind., is a new double-ended snow plow, the "Twin-Type," designed especially for use where a turntable or other such facilities are not available. As either plow wing at each end can be swung forward or returned, it is possible to plow snow on both sides of the track simultaneously or to either the right or the left side. The plow at either end can be adjusted vertically in 1-in. increments from above the top of rail to 5 in. below top of rail. In travelling position it can be raised to approximately 9 in. above the top of rail. The plowing action of the "front" plows is supplemented by high snow wings on the sides of the car, capable of extending out 8 ft. 2 in. from the center line of track on either side.

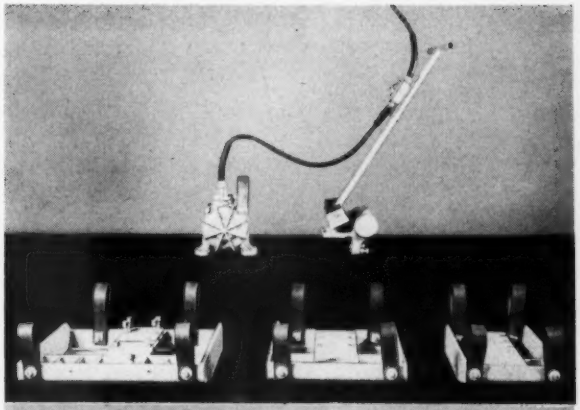
The new "Twin-Type" plow has many of the same features of the Jordan Type A snow plow including rigid welded underframe with pointed ends to give maximum support to the plows. All wings are operated by compressed air cylinders, and the unit is equipped with standard AAR brakes and a hand brake. The cab is insulated and has provision for the installation of heating equipment if desired. A set of controls is furnished at each end of the cab, both working from the same air supply.

IMPROVED TIE END REMOVER

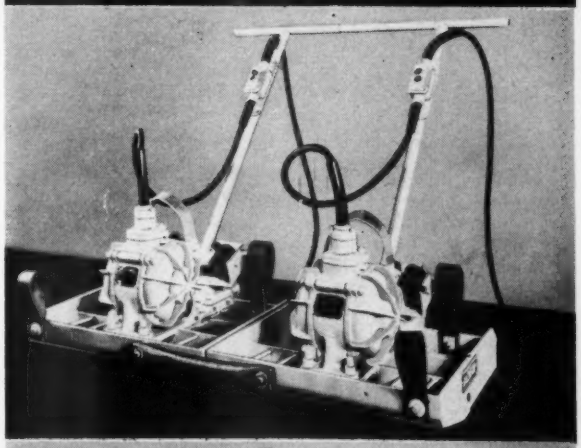
THE Woolery Machine Company, Minneapolis, Minn., has announced that an improved model of the Woolery Tie End Remover is now available. This unit, which is a companion machine for the Tie Cutter, is used to push the tie ends outward and clear of the rails. In operation, after lifting out the center portion of a tie when it has been cut by the Tie Cutter, the operator lowers the hydraulic ram of the Tie End Remover into the tie bed, and opens a valve which causes the pistons of the ram to move outward. When the tie ends have been pushed clear, the operator closes the valve and springs within the hydraulic cylinder cause the ram to retract. The whole process can be carried out in about one minute. The improvement recently made to this machine is the incorporation of a quick-acting relief valve which permits the hydraulic ram to be left in the tie bed while the remainder of the machine is quickly removed from the track in the event of an emergency.

RACOR TIE PAD

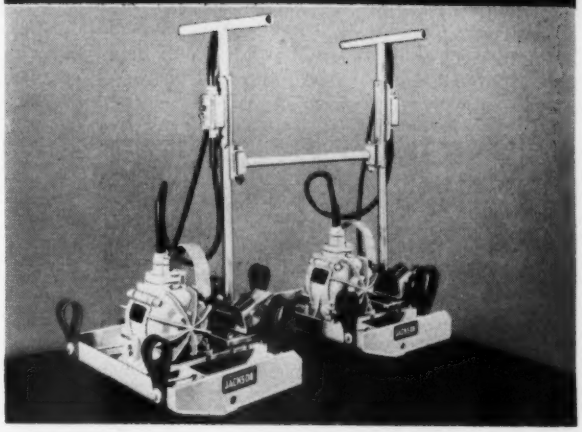
THE RAMAPO Ajax Division of the American Brake Shoe Company has developed a tie pad for use in preventing the mechanical abrasion of switch ties, bridge timbers and ties on curves, through road crossings and station platforms, and at other critical locations. The Racor Tie Pad is the result of four years of research and laboratory testing, in an effort to find the most economical tie pad for severe service conditions. Exhaustive tests, conducted on the Ramapo Ajax Tie Wear Machine, are reported to have shown the new pad to be highly durable and effective in the prevention of mechanical wear. The pad is of a rugged rubber-fiber compound which is said to provide high tensile and compressive strength combined with sufficient flexibility to adapt itself to the irregular surfaces of the tie. The pad is coated with an asphaltic sealing compound to prevent the seepage of water and foreign matter beneath the pad. Racor Tie Pads are available in a wide range of standard sizes.



Compactor bases are available in sizes from 12 in. to 24 in. and are interchangeable. Vibratory motor and operating handle in background.



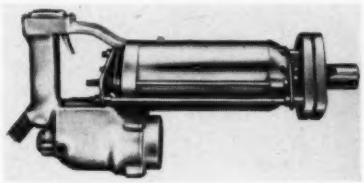
A pair of compactors joined as a team so that one operator can do the work of two. These two compact a width of 4 ft.



When hooked together in tandem, the operator directs the travel by pivoting the rear compactor. One pass is said to produce specified densities.

ELECTRIC HAMMER DRILL

A NEW 2-in. capacity, heavy-duty electric hammer drill, designated Model 26-RO, has recently been made available by the Syntron Company, Homer City, Pa. Designed to speed up quantity hole



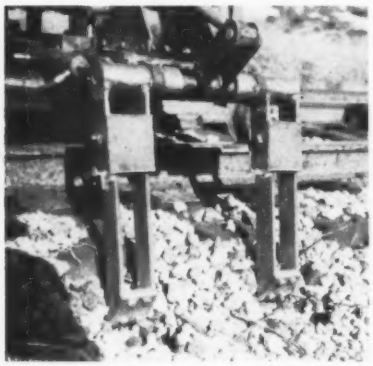
drilling in concrete and masonry, the new hammer drill combines the power of an electromagnetic hammer with automatic rotation of a spiral fluted, carbide tipped drill bit. The automatic rotation is accomplished by a rubber ratchet mechanism which utilizes the recoil of each hammer blow to turn the drill bit slightly. The manufacturer claims that considerable torque at the correct speed is produced as the hammer piston operates at 3,600 blows per min. In addition, operator fatigue is reduced since manual quarter turning of the drill bit during operation is eliminated.

COMPACTOR BASES

NEW and more simple bases of variable width have been developed by Jackson Vibrators, Inc., Ludington, Mich., for its manually operated Vibratory Compactors. These bases are available in any size from 12 in. to 24 in. and are interchangeable so that the vibrating motor and operating handle can be attached to any one. Since there are just three component parts involved, it is said that switching bases requires just a few minutes work so that one machine can be used to full potential in compacting granular soil in trenches as narrow as 12 in., compacting sub-bases for concrete floors, fills of granular soil such as for bridge approaches or pipe lines, blacktop highway patching and widening, paving drives, walks, railway platforms and street crossings and similar operations.

Attachments have also been made available for coupling a pair of the compactor bases and operating handles together in side-by-side or in tandem positions so that one operator can do the work of two. The two-abreast hook-up has a total width of 4 ft.

For additional information on any of the products described on these pages, use postcards, page 291.



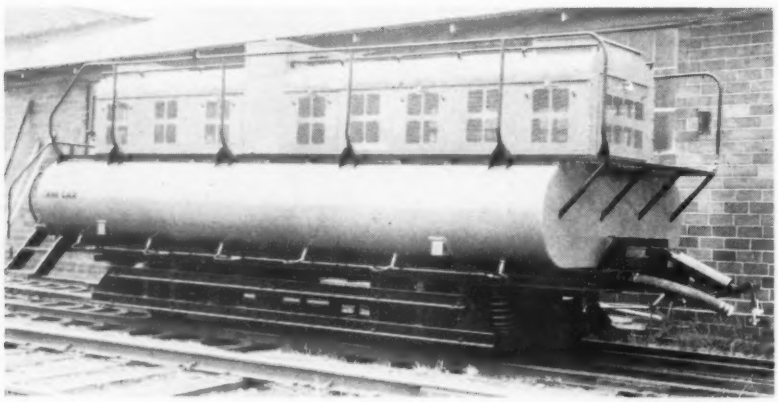
Two tamping bars at each side force the ballast under the ends of two ties to a depth of 6 in. No tie nipping is required.

The Jack-All is a self-propelled unit operated by one man and is used for raising and tamping track ahead of machine tampers.

HYDRAULIC JACK AND TAMPER

THE KERSHAW Manufacturing Company, Montgomery, Ala., has developed a combination hydraulic jack and tamping machine which has been designated the Jack-All. This machine is a self-propelled track-mounted unit which raises the track and tamps ballast at the ends of two ties at one time. It has two hydraulic rams which automatically operate two rail dogs as the jack foot is lowered between the ties, thus raising the track. It also has two hydraulically operated tamping bars on each side which press or push the ballast under the tie ends to a depth of six inches. The ballast is said to be forced under the ties with a pressure of 1,500 lb.

The Jack-All is powered by a 12-hp. gasoline engine which drives two hydraulic pumps delivering a pressure of 1,000 p.s.i. and is propelled by a hydraulic motor. The weight of the machine is approximately 4,000 lb. New improved eye-level spotboards and a set-off are furnished with the machine. The Jack-All is operated by one man with another operating the spotboard. The operating cycle for each raise is said to be about two minutes. On some recent tests, the manufacturer states that 1,155 ft. of track was raised in less than 2 hr. while it was working ahead of a Multiple Tamper. On other tests, he says, the Jack-All has raised track one inch at the rate of a rail every four minutes.

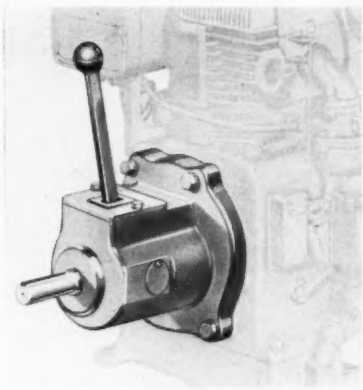


TANK TRAILER UNIT FOR WEED SPRAYER

A 3,000-GAL. capacity tank trailer unit designed for use in conjunction with its Class W66 weed sprayer, has recently been announced by Fairmont Railway Motors, Inc., Fairmont, Minn. The new unit, known as the class W70 series A, is spring-mounted and has air brakes controlled from the cab of the spray car. It is equipped with a portable-type gasoline engine driven pump of 10,000 gal. per hr. capacity, which is used as a transfer pump to fill the tank and also, when spraying, provides hydraulic jet agitation for the liquid in the tank. The trailer includes a covered filler opening at the center of the tank.

B&S ENGINES FEATURE NEW CLUTCH

BRIGGS & Stratton Corp., Milwaukee, Wis., has announced a new clutch available from the factory installed on their models 9FB,



14FB and 23FB engines. The clutch is manually operated, compact and said to have ample capacity for every operation within the power

range of the engines. The manufacturer claims that the new dry-plate, over-center type of clutch, mounted directly to the engine crankcase, provides positive neutral and power engagement—assuring absolute safety of operation. The power take-off shaft is carried in a double thrust ball bearing. No lubrication is said to be required other than occasional greasing of the bronze throwout bearing, which is easily accessible through a greasing porthole.

TIE-BED SCARIFIER

A NEW machine, designated as the W87 Series A Tie-Bed Scarifier, has been announced by Fairmont Railway Motors, Inc., Fairmont, Minn. The manufacturer claims that after the old tie has been removed, one operator with this new machine can dig a uniform tie bed 10 ft. long in an average time of 1 min. This is said to make the insertion of new ties a relatively easy and simple task. The W87 is hydraulically-operated throughout. The drive for the renewable digging teeth is by a hydraulic motor through a speed reducer and three roller chains. Two hydraulic cylinders raise and lower the digging assembly which is pivoted at the rear of the unit and has its own separate frame. The machine is self-propelled by a hydraulic motor through a speed reducer. A built-in turntable, operated by a hydraulic cylinder, aids in set-offs.

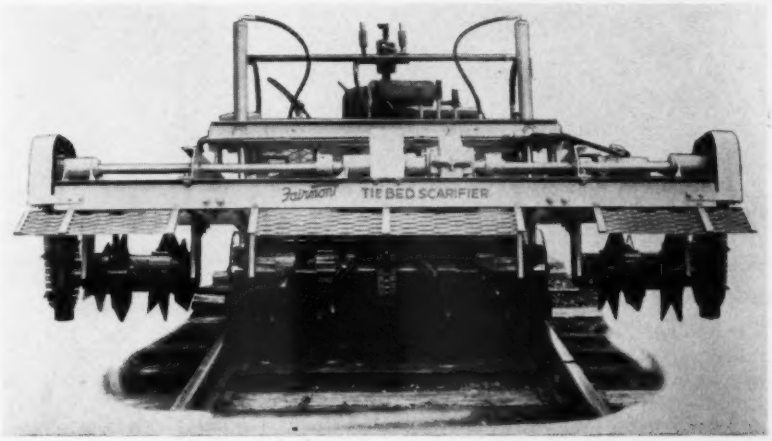
A four-cylinder, air-cooled engine drives the two hydraulic pumps through V-belts, and is equipped with a manual clutch and electric starter. Service brakes are vacuum controlled while the parking brake is manually controlled. Both are of the four-wheel type. The main frame of the machine is of structural steel, and floors and guards are made of expanded metal. The unit has $1^{15}/_{16}$-in. axles and double-row taper roller axle bearings. Front wheels, which carry most of the load, are 16 in. by $^{7}/_{8}$ in., demountable. Rear wheels are 16 in. by $^{5}/_{16}$ in., also demountable. For emergency use, the machine is equipped with a hand-operated hydraulic pump which can be used to raise the digging assembly and operate the turntable. To keep the hydraulic oil clean, the suction line has two 200-mesh strainers, and the return line is equipped with a large capacity 10-micron micro filter.

DUAL-VOLTAGE PORTABLE GENERATOR

A DUAL-voltage 5-kw., portable generator has been announced by the Homelite Corporation, Port Chester, N. Y. The new generator, Model 32A115/230-1, can carry a continuous load of 5-kw., single-phase, 60-cycle alternating current, at either 115 or 230 volts. The portable generator is designed to start and operate electric tools and equipment such as electric saws, grinders, drills, routers, tampers and sanders in the construction and transportation fields, and for emergency lighting and standby power. A 115-volt ac standard convenience outlet is supplied, along with a special waterproof 3-pole receptacle for connecting either 115- or 230-volt motors, tools and appliances.

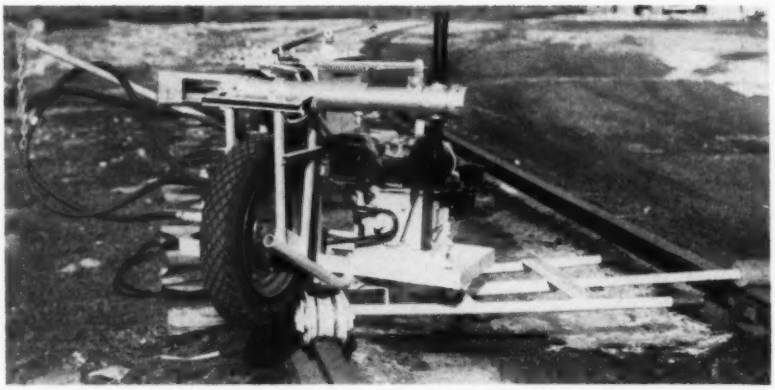
Driven by a Homelite Model 32 gasoline engine, the generator has specially impregnated armature and coils designed to give high resistance to oil, moisture, and abrasive dust. The armature is keyed directly to the engine crankshaft and the large-size carbon brushes are easily accessible. Voltage regulation from no load to full load is approximately 6 per cent. Ball and needle bearings are used at each point of friction and a pressure vapor oiling system lubricates all engine parts. All major castings of the unit are made of aluminum alloy.

The manufacturer claims that rain- and dust-proof ignition, plus an adjustable jet-type pressure fuel system make the Homelite 1-cylinder, air-cooled, 2-cycle gasoline engine easy to start in all types of weather. The unit is equipped with adjustable handles so as to allow it to be carried by either two or four men. The generator, which is 29 in. long, 24¼ in. wide, and 25½ in. high, weighs 228 lb., complete with engine.



For additional information on any of the products described on these pages, use postcards, page 291.

The Nordberg Hydraulic Spike Puller with the power plant off the track.



When the unit is moved along the rails on its two roller wheels and outrigger, the pulling tool is set on a carrying rack.

HYDRAULIC SPIKE PULLER

THE Nordberg Manufacturing Company, Milwaukee, Wis., has announced the development and production of a new machine designed for tie-renewal work. This unit, designated the Nordberg Hydraulic Spike Puller, is powered by a piston-type hydraulic pump, as used for years on the Power Jack, driven by a Briggs & Stratton engine. The spike-pulling tool weighs 45 lb. and is a hydraulic ram with a claw which fits over the head of the spike. When the operator presses the valve trigger, the spike is pulled and automatically ejected from the claw. The claw then returns to the pulling position.

The power plant is mounted on a frame equipped with two ball-bearing double-flanged rollers and an outrigger for movement along the rails. The pulling tool is connected to the power plant by flexible hydraulic hoses which are long enough to reach spikes at either rail. A pneumatic wheel is provided for setting the machine on and off the track.

NEW LIGHTWEIGHT BRUSH-CUTTING SAW

DESIGNED for use by railroads, utility companies, contractors, etc., for right-of-way clearance, the Brushmaster saw has recently been made available by Brushmaster Saw, Inc., Keene, N. H. The machine, which is carried by one man by a sling suspension type belt, weighs 35 lb. and is powered by an air-cooled, two-cycle gasoline engine. The circular saw blade is easily replaceable. Safety features of the saw include shielding of all moving parts of the motor, an angular bar which prevents the operator from moving into the saw blade, an engine throttle located at the hip for quick engine control, and an automatic clutch which disengages the saw when the engine is idling. The manufacturer claims that the Brushmaster, operated by one man, will clear brush six times faster than hand methods and is effective on briars, brambles, vines, brush, and saplings.

MOTOR CAR AUTOMATIC COUPLER

THE Maintenance Equipment Company, Chicago, has taken over the sale of the device known as the Ryd-in Motor Car Automatic Coupler. With this coupler, the operation is said to be automatic and the coupling is accomplished simply by shoving two car units together. Also, the coupling is said to be safe because the couplers need not be touched when put into operation and, once engaged, they cannot be-

(*Continued on page* 288)

CHARLES H. READE
President

LEONARD J. READE
Sec'y Treas.

CHARLES F. READE
Vice-President

D. M. DeWITT
Western Manager

CHARLES R. SHERMAN
Asst. to President

C. A. PARRISH
Production Manager

GLENN CARPENTER
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DR. W. L. TANNER
Research

DR. LELAND BUTLER
Agronomist

HERMAN STEUDEL
Agronomist

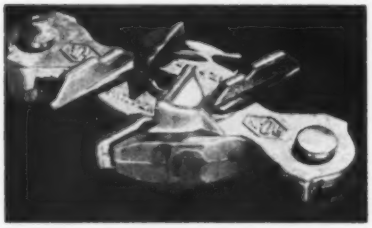
DR. I. MINSKY
Chemist

FRED C. SAUTTER
Spraying Service

We cordially invite maintenance men to discuss with our Staff any problems that they may find themselves confronted with, in connection with Weed and Brush control, whether they be chemical, agronomic, or spraying service.

(*Continued from page* 286)
come uncoupled without the actuation of a coupling lever.

In those cases where it is necessary to couple trailers carrying extra long material, such as rail or switch ties, the manufacturer has provided an extender with a sim-

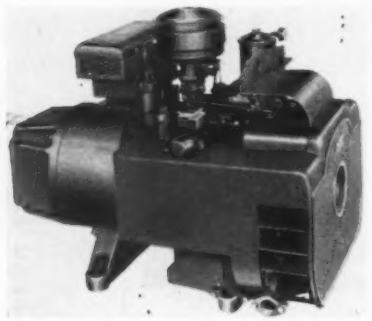


ple "dummy" coupler attached at each end which may be introduced between the standard Ryd-in units on the two cars. These extender bars may be as long as necessary to separate the two cars to the desired distance and are made available by the manufacturer.

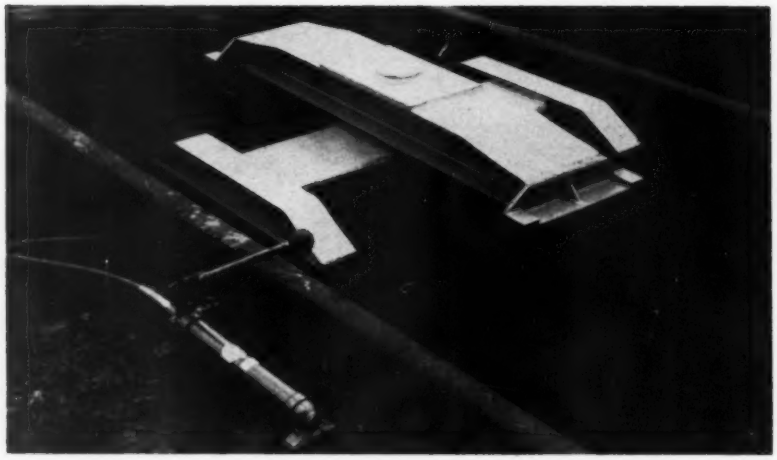
Ryd-in couplers are manufactured in both aluminum alloy and cast steel and may be purchased of either material as specified at the same price. It is said that the aluminum has the advantage of light weight, while steel is preferable for those jobs where heavy shock is present.

GENERATING PLANT

TO BETTER meet the growing demand for independent electric power plants, D. W. Onan & Sons, Inc., Minneapolis, Minn., has marketed an air-cooled gasoline-powered electric generating plant in the 5,000-watt and 10,000-watt capacities. It is said to have a highly efficient vacuum cooling system which employs a powerful centri-



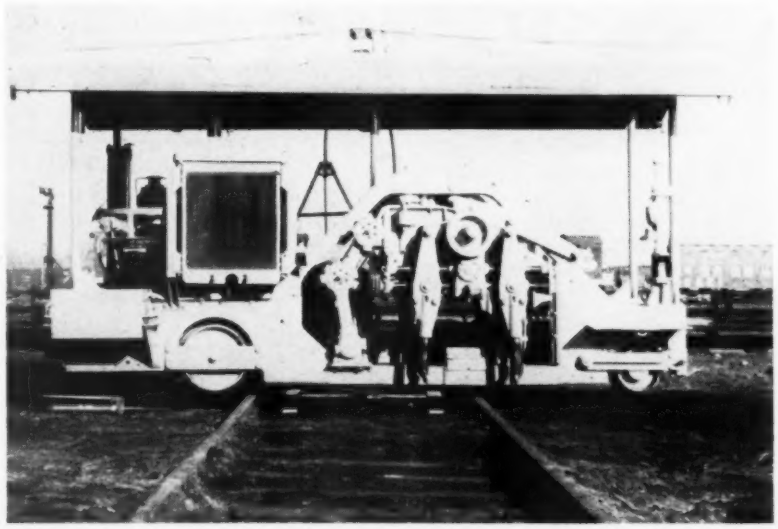
fugal blower that draws cold air through the generator and over the engine and, at the same time, discharges heated air out of an 8-in. by 12-in. side vent.



After the turntable has been placed on the ties between the rails and the machine has been correctly spotted over the device's lifting platform, a hand pump is operated to raise the machine so it can be turned.

TAMPER TURNTABLE

A TURNTABLE for turning the Matis Tamper has been developed by the Matisa Equipment Corporation, Chicago. With this turntable which can be assembled by two men, it is said that the tamping machine can be turned in 10 to 15 min. without the use of any tools. Weighing approximately 600 lb., the turntable consists of four main parts; a base which rests on two ties, a hydraulic cylinder, a hydraulic pump, and a platform, the edges of which support the tamper while it is being turned. Shims are provided for making the turntable level where the ties are not flat. The turntable raises the tamper about 3 in. and can be used on tracks with rails of any section.



When the tamping machine has been turned 90 deg., the lifting platform is in the position as shown in the other view.

The gasoline engine is a twin-cylinder, horizontally opposed, vacuum air-cooled, four-cycle type which is said to be the first of its power range (13 hp. and 20 hp.) to be developed exclusively for electric plant application. Other design details are said to include easy starting under all conditions with an impulse-coupled, high-tension, magneto ignition system that permits quick manual starting without batteries or when batteries fail; oversize bearings; Stellite exhaust valves, seat, ports and guides; 6-quart oil capacity; quiet operation with the engine completely enclosed in a steel housing; a single cooling system for both engine and generator; a suppression system that eliminates radio interference.

(*Please turn to page* 290)

ALADDIN LUBRICATOR

In the last six months

27

U. S. railroads have installed Aladdins

•

You can buy TWO Aladdins without an "A. F. E."

Only one moving part:

The "Aladdin" has no pumps or valves. A spring-loaded piston, the *only* moving part, descends in a cylinder under vibration from traffic—and delivers the required amount of standard grease *automatically* to the running side of the rail.

One-man installation:

No track alteration, rail drilling or gauge widening is required to install the "Aladdin". And since it weighs only 50 pounds—it can be handled and installed by one man *in less than half an hour.*

Proved performance:

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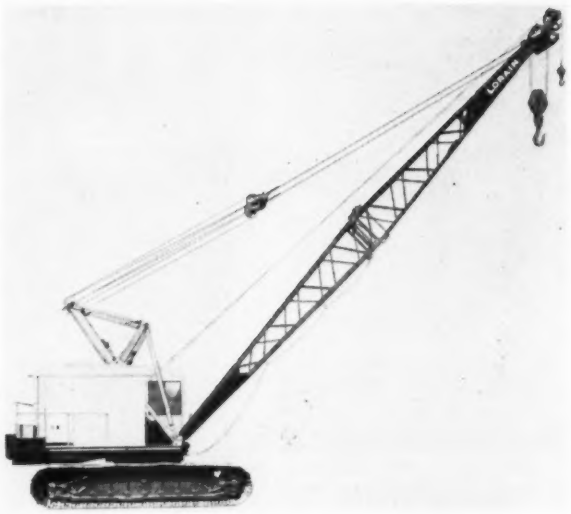
For additional information on any of the products described on these pages, use postcards, page 291.

RIGHT—The new Lorain Model 820-KS, 45-ton Crawler Crane.



LEFT—The Schramm Skyworker employed in storage tank painting.

CROW'S NEST

SCHRAMM, Inc., West Chester, Pa., has introduced a man-carrying mechanized crow's nest that is moved about at the will of the operator and has a compressed air outlet for operating air tools at various heights up to 37 ft. above the ground. This mechanism, designated the Schramm Skyworker, is adapted to all types of overhead work, up to the height and reach (28 ft. from the center of the turret) of the machine on bridges, tanks, catenaries, signal towers, etc. It enables one or two workmen to elevate themselves without the use of ladders or pole-climbing spurs.

The Skyworker is mounted on a Schramm Pneumatractor to provide a self-propelled combination that can be driven under its own power from one job to another. The crow's nest of the Skyworker has a capacity of 500 lb. and is mounted on a rotatable articulated boom controlled either at the crow's nest or at ground level for elevation, extension and a rotation of 370 deg. A Schramm 105-c.f.m. Pneumapower unit provides air for operating tools such as drills, chipping and calking hammers, paint sprays, sand blasts, etc., at these heights.

45-TON CRAWLER CRANE

A NEW Lorain crawler crane has been announced by the Thew Shovel Company, Lorain, Ohio. This is a companion machine to the 45-ton Lorain Moto-Crane, Model MC-824. The new model is designated as Lorain 820-KS and consists of a diesel-powered turntable with hydraulic coupling power take-off mounted on newly designed, extra wide and long crawlers. Air assist on boom hoist and crawler travel is standard. High-speed, double-threaded, worm-driven boom hoist with ratchet and pawl safety lock are features especially incorporated for crane work. The crawlers are of the 2-speed, chain-drive type, 18 ft. 6 in. long and 14 ft. 2 in. wide, with 48-in. wide cast manganese-steel tread shoes. The crawler steering and tread-travel lock have full air control, with auxiliary manual controls. Power for the crawlers' two travel speeds in both directions is transmitted by a separate, horizontal, independent travel shaft on the turntable.

A new, two-piece, pin-connected boom is provided on the 820-KS crane. With it is used a power-operated, tilting and folding type high gantry and a floating harness for reeving six parts of boom hoist cable. Center sections in 10- and 20-ft. lengths are available to lengthen the boom to 100 ft. Eye splice type center section pendant inserts are used. A 25-ft. tip extension of 6 tons capacity that can be used either straight or goose-necked is available. Open throat construction at the tip of the boom allows hoist cables and hook block to clear the boom when operating at near vertical position.

"ELECTRIC EEL" CLEANS SEWERS—DRAIN TILE

A GASOLINE-engine powered "electric eel," manufactured by the Ohio Tool & Engineering Co., Springfield, Ohio, has recently been announced. This device, designed to be used in locations where electric power is not available, cleans out roots, stones, and debris from sewer, wasteland and field tile installations in one operation. Weighing 66 lb., the unit is completely portable. It is designed to clean pipe 1¼ in. in diameter and larger, and has sufficient power to handle 300 ft. of cable. The 1½-hp. gasoline engine is back-geared 6 to 1, has an instantaneous kick-out, and an adjustable friction clutch between the engine and the cleaning cables. The new model also features a flexible connection for joining cables which is said to eliminate breakage.

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

The following is a complete list of products mentioned in the advertising and editorial pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and postage paid cards in requesting it. In each case give product name and page number. The information will come to you directly from the manufacturer, without obligation on your part.

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WHAT'S THE ANSWER? . . .

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Insulated Joints in Welded Rail

To what extent are short rails necessary where insulated joints are installed in stretches of continuous welded rail? What length rails are preferable? Why? In what pattern should they be laid? Explain.

Use Four Short Rails

By L. R. LAMPORT

Chief Engineer-Maintenance, Chicago & North Western System, Chicago

At insulated-joint locations in stretches of continuous welded rail, it is desirable to place short rails, 25 ft. to 37 ft. long, on each side of the insulated joint.

The wide gap at all insulated joints, which is necessary for the installation of an end post, results in heavy batter of the rail ends. This condition on the ends of the continuous welded rail is undesirable because it is necessary from time to time to build up the rail ends and renew the insulating material in the joint. This work is more difficult if the insulated joint is placed on the ends of the welded rails. While the proper amount of anchorage will restrain the movement of the rail ends, there is always a greater tendency for the joint gap to vary more at the ends of continuous welded rail than at the ends of ordinary bolted rail. The amount of this variation will depend on the temperature at the time the work is being done as compared to the temperature at the time the rail was laid.

If bolted rails are placed on each side of an insulated joint in continuous welded stretches, the variations of expansion and contraction will not be more than is provided in the two bolted joints.

The reason for using a rail between 25 ft. and 37 ft. long is that a repair rail can then always be cut from a 39-ft. rail if it ever becomes necessary to adjust the expansion of the continuous welded rail, to renew the rails because of excessive batter, or in case of breakage of one of the ends at the insulated joint. Such short rails will also make it possible to cut the ends of the continuous welded rail and redrill them if necessary because of any failure within the limits of the joint bars.

Some roads use only one bolted rail at the insulated joint and this does help in the matter of any work to be done at the insulated joint. However, it does not overcome the objection of having the insulated joint placed on the end of the other string of continuous welded rail.

No Fixed Pattern Used

By CHIEF ENGINEER

We have found from the experience of laying continuous welded rail at a fairly high temperature that it is necessary to install short rails at insulated joints to protect the thimble insulation in these joints when the rail contracts. Most of our insulated joints are laid on a 19½-ft. stagger and we have installed short rails longer than 19½ ft. and shorter than 39 ft. but we have not worked out any fixed pattern.

Short Rails Necessary

By C. E. WELLER

Division Engineer, Illinois Central, Chicago

Where stretches of continuous welded rail are laid, short rails are a necessity adjacent to insulated joints. I have witnessed stretches of welded rail where no short rails were used. In the summer, when the daily temperatures are appreciably above the laying temperature, the joints are so tight it is impossible to install new end posts when renewing the insulation. In the winter, when the temperatures are below the laying temperature, joints pull open ½ in. to ¾ in. and it is impossible to close the gap and replace the bolts.

A few roads have placed a short rail on both sides of the insulated joint, but the majority of the roads

---

Answers to the following questions are solicited from readers. They should be addressed to the Whats' the Answer editor, Railway Track and Structures, 79 W. Monroe St., Chicago 3, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the June Issue

1. What, if anything, should be done with brush on the right of way after it has been killed by chemicals? Why? If disposal is considered necessary, how can this best be accomplished?

2. What are the relative merits of concrete and wood for use in the decks of working platforms in diesel repair and servicing buildings? Explain.

3. What improvements, if any, are needed in track tools to make them safer to use or more servicable? Explain.

4. What methods can be used to inspect old creosoted piling in trestles to determine the extent and location of possible defects? Which of these give the best results? Explain.

5. Where the oxyacetylene method is used for the shop cropping of rail, what procedures and measures will the best results? Explain.

6. What is the best method of cleaning oil-storage tanks prior to dismantling them for re-erection? Explain.

use only one short rail.

There is no reason to specify the length of the short rail. Any length under 39 feet would serve the purpose. Most roads plan their welded rail many months in advance of the laying and usually prepare a detailed plan showing the length of each string as well as the length of the short rail at the insulated joint. When this is done, it is not possible to take advantage of short rails furnished from the mill and it becomes more economical to use a half rail (19 ft. 6 in.).

Priming Steel with Zinc Chromate

What are the advantages and disadvantages of zinc chromate paint as a priming coat on steel? Explain.

Still Like Red Lead

By J. B. SCHAUB

Assistant Engineer of Buildings, Illinois Central, Chicago

I admit partiality to good old 100 per cent red lead and genuine linseed oil. My experience and observations have been confined largely to lead and oil as a steel primer coat. Those experiences, as well as the literature on the subject which I have read, have led me to conclude that it is an excellent and most satisfactory steel primer. I recognize there are some legitimate arguments against its use. These include the marked rise in price of this material during recent years and the length of time required for drying, especially where the steel must be handled in the shop within a matter of 8 to 10 hrs. after the shop coat is applied. These features have made it highly desirable to find a less-expensive and quicker-drying satisfactory substitute.

Perhaps the use of the word substitute is not correct as I doubt if there is a substitute, but it may be possible to find a paint coating that will meet specific and notably limited requirements. As a near substitute I would choose a steel paint primer having a fair percentage of lead.

In most instances the steel primer coat needs to meet only limited requirements. The coat of paint is applied in the shop under favorable and controlled conditions and with the steel in possibly the best of condition. The coat of paint is to function as a protective coating for a limited period of time and in many instances only a matter of days or weeks until the field coats will be applied. However, it must function as a good base for the field coats and must form a firm bond between the field coats and the steel.

The manufacturers of zinc-chromate paints contend, and it is apparently borne out in practice, that their shop paint does function as an effective base coat. Zinc-chromate paint is cheaper than lead-and-oil paint, costing about half, I believe. I am inclined to believe this lower cost is the main advantage of zinc-chromate paint and its quicker-drying characteristic is of secondary importance. The cost advantage, however, is minimized when it is recognized that, in the final analysis, the cost of the shop-coat paint is a very small percentage of the total job cost.

A few years ago a study of shop-coat structural-steel primers was made by Messrs. Frye and Diehlman and the report published in the American Railway Engineering Association Bulletin 482. I was interested in the results obtained in making numerous tests of various prime coats. The exact drying time of 100-per cent lead paint was not given. However, a 75-per cent lead paint with a 25-per cent iron-oxide base did fall within the drying time of eight hours or less, which is a time limit considered to be acceptable in most fabricating shops. Under the summary of findings was this quotation. "A 100 per cent red lead in linseed oil was the primer which afforded the best protection based on the average ratings of the combined controlled and normal film-thickness tests. This would have been anticipated from the records of any previous panel tests. . . ."

I conclude that if there is any doubt as to the length of time that may elapse between the application of the shop coat and the field coats, a lead-and-oil primer should be used.

Not Suited to Some Places

By ASSISTANT ENGINEER

An explanation of the electrochemical action which accounts for most of the reduction in iron and steel structures will help to point up the advantages and disadvantages of zinc-chromate primers.

Carbon steel which is used in most railroad structures does not have a homogeneity of metal. This heterogeneous character furnishes the seat of electro-chemical forces. Under a microscope the surface texture is granular. The grains consist of pure iron, carbon, silica, phosphorus and sulphur. These grains form a distribution of anode and cathode points, lines, or areas on the surface of the metal and in the presence of a moist atmosphere an electric current flows from the anode (the pure iron grains) to the cathodes (the other materials).

Such currents carry metallic iron into solution as ferrous ions, forming a hydrogen-ion concentration. In other words an acid is manufactured, the hydrogen ion being the positive ion of the acid. If the ferrous ion is quickly oxidized to a ferric condition, the slightly soluble ferric hydroxide is precipitated as a solid in close contact with the metal surface, thereby stifling further anodic attracion.

A priming coat of paint can be applied to prevent moisture contact with the steel. The pigment material used in paint must prevent the ionic conductance. Visualizing that the average thickness of a coat of paint is only about 0.001 in. you can realize the work cut out for the paint film over its useful life.

In addition to acting as a moisture retardant, the ionic attraction will be retarded if the pigments in the priming coat contain elements which will combine to form an alkaline balance next to the metal surface. Chromate ions are strong oxidizing agents whose stifling action is more pronounced when the metal surface becomes passive. The chromates act in a neutral or alkaline environment in the absence of high chloride-ion concentration.

This explains the poor performance of zinc chromate primers in atmospheres prevailing, for example, in heavy manufacturing districts, in engine terminals or along our coasts. In such an atmosphere chromate pigments can actually accelerate corrosion because they oxidize and thereby remove the film of hydrogen which surrounds and polarizes the cathodic area. This was

stated previously when the formation of the ferric hydroxide was explained. The principal culprit in the atmospheres mentioned above is sulphur dioxide.

In other atmospheres, zinc chromate gives an excellent account of itself. Continued research is being conducted to improve its inhibiting action. Combining zinc chromates with other pigments such as iron oxide has been one means of reducing their otherwise high costs. Improvement of the film against moisture entrance is also being studied. The slight solubility characteristic of zinc materials is of concern to paint makers. Zinc oxide is an additive which helps counteract the solubility weakness. Exposure tests made in Florida show that solubility is an important factor in the stability of anti-corrosive films. Pigment-grinding tests have shown that if the grinding is too fine, the needle-like particle form of the pigment is destroyed. This, in turn, affects the layering qualities of the primer.

The solution of these problems together with the ever increasing attention to the task of getting clean metallic surfaces on which to apply priming coats of paint will justify the use of high cost materials, the end purpose being to find a film that will have a long life and one that will decrease the damage done to the steel surfaces.

Diesel Fumes in Old Steam Enginehouses

How can fumes from diesel locomotives being shopped in old, conventional-type steam-locomotive enginehouses best be removed with minimum loss of building heat? Explain.

Heat Air, if Necessary

By Architect

If a roundhouse is meant, I have no information to offer as we have shied away from using roundhouses for shop work on locomotives. We are using them in several places for turn-around work, but that is the only use we make of them.

We remodeled a portion of one of our locomotive-erecting shops to serve as a diesel-servicing shop. Later, as more locomotives were placed in service, it was found necessary to provide servicing facilities at another point to supplement those already in service. We have followed similar patterns for the removal of exhaust fumes from diesels at both places except that at one we heat incoming air to replace that lost by exhausting fumes from the building, while, at the other, we had an enormous building volume from which to draw air.

Use Baffles, Vents, Heaters

By L. H. Laffoley

Engineer of Buildings, Canadian Pacific, Montreal, Que.

Every satisfactory method for removing diesel exhaust fumes from any conventional type of enginehouse must remove a substantial amount of air, with a consequent loss of valuable heat in winter time. Any acceptable system must keep the heat loss to a minimum while maintaining fresh air at all work levels. If the exhaust stacks on all diesel locomotives were in the same position, the problem would be simple and a standard smoke jack or a power exhaust, would be sufficient. As a maintenance shop may be required to service locomotives from two or more manufacturers, each producing several types of locomotives, with exhaust stacks in different locations, the fixed jack is considered impracticable.

A satisfactory and economical system to accommodate one or more units per stall, either headed in or backed in and spotted to suit working conditions rather than smoke jack locations, is provided by installing three 18,000 cfm. power ventilators in the roof on the center line of each stall, at about quarter points and midway between the front and back walls, each ventilator being individually hand-controlled from the floor. Smoke jacks for steam engines should be removed at all stalls to be used for diesels, and the roof opening should be used for one power ventilator.

To prevent the exhaust blast from escaping (or by-passing) the nearest roof ventilator, baffles of asbestos board or other fire-resistant material are suspended from the ceiling to a height of about 15 ft. above the top of rail, midway between stalls and extending from the front wall to the back. Cross baffles are usually unnecessary.

To replace the stale air removed by the roof ventilators with fresh air, heated in winter, steam-heated blast coils of 5,000 cfm. capacity, with filters, are installed in the back walls of the enginehouse near the floor level. These are usually at the bottom of the window opening in the back walls at each stall, through which filtered warm fresh air is drawn by action of the roof ventilators. These blast coils should be equipped with automatic, steam-operated control valves. In case of a failure of the steam or condensate-controlling equipment in climates where the condensate may freeze, they should also be equipped with thermo drains in traps.

Unit heaters with automatically controlled steam supply are installed at the back wall near the roof to spread the warm fresh air from the blast coils along the floor so that it will not be pulled directly to the roof ventilators. One unit heater is required for every two to three stalls, depending on local conditions.

When a diesel locomotive stands with its engine idling in an enginehouse thus equipped, the roof ventilator nearest the exhaust stack is turned on by hand to run continuously. The baffles prevent the exhaust gases from spreading through the house until the roof ventilators can take them away. The air thus removed is replaced with filtered fresh air from outside and is heated in winter. Reasonable control of the power ventilators will keep heat losses through the roof exhausters to a minimum.

Experimentation Will Decide

By Assistant Engineer of Buildings

This was a definite problem when we started using our old steam-locomotive enginehouses for housing and repairing diesel locomotives. In the summer months the doors to the enginehouses were opened as well as the windows in the dormer on the roof. This provided the ventilation necessary during a short period of the year. However, it was found that during the fall, winter and spring months, the heat loss in the building was much too great with the doors closed and the windows

open. First a set of manually controlled window-type fans with louvers to match were installed in the house. All fans were placed on the turntable side of the dormer on the roof of the enginehouse. We soon found that these window-type fans are satisfactory except at the times when we have winds blowing toward the exhaust fans. Then the fumes in the engine house become very offensive.

From further investigations we have made, we have reached the conclusion that 30-in. foundry-type ventilator fans should be installed in the roof. Breather ducts and baffles inside the house will probably also be required before we arrive at a satisfactory solution to this problem.

Why "Break-In" New Tractors?

Why should tractors be "broken-in" when put in service? What should the breaking-in process include? How should it be carried out?

Not Necessary

By J. M. Giles

Special Representative, Sales Development Division, Caterpillar Tractor Company, Peoria, Ill.

Precision manufacturing and modern testing methods used in the manufacture of diesel powered track or wheel-type tractors eliminate the necessity of non-productive "break-in" periods. The diesel engine of today is packed with horsepower ready to work without long grooming.

Time spent by those charged with the operation and maintenance of such units in learning how, where and when to lubricate them is time well spent and is only a fraction of the time spent in so-called "breaking-in" periods.

Limber It Up and Save Money

By Fred Schreck

Assistant General Supervisor of Service, Industrial Power Division, International Harvester Company, Chicago

The power that is packed in your new crawler tractor will serve you better and serve you longer if you give this expensive piece of equipment a fair chance to limber up for its lifetime of work. The "muscles" of the tractor are built in at the factory but their proper conditioning depends on you. You, as the "trainer" of the tractor during the break-in period, determine the future effectiveness and operating cost of the machine.

First of the few items to check during the all important break-in period is the lubricating oil. Many manufacturers prefer to deliver tractors with a "ship away" oil that contains a rust inhibitant necessary if the tractor is to be stored for any length of time before being placed in operation. If you're not going to use your tractor for some time after delivery, don't drain this "ship away" oil. But under no condition should this oil be used if the tractor is to be operated immediately. Running the tractor on the job with "ship away" oil is begging for trouble. Before your tractor starts working, look at the shipping tag. If the tractor contains "ship away" oil, drain it and replace it with the recommended lubricant.

Instead of "ship away" oil, some tractors are shipped with break-in oil. With this oil the tractor can be operated immediately, but be sure you drain it at the time indicated by the manufacturer on the shipping tag. After that, follow your operator's manual for instructions as to what type of oil to be used.

Incidentally, factory recommendations for lubricating oil are more important today than ever before. There are two main reasons why this is true:

(1) Engines deliver more horsepower today for the same cubic-inch displacement than they used to some years ago. This is accomplished, of course, by running the engines at a higher rated r.p.m. Naturally, a faster running engine demands better lubrication than an engine that turns over comparatively slowly.

(2) Today's fuels frequently have a higher sulphur content, especially in certain parts of the country. Therefore lubricating oils with an additive are recommended to minimize the effects of contamination by fuels with a high sulphur content. In other words, the fuel and the lubricating oil must be "compatible." If they are not, the rate of wear on piston rings, cylinder walls and bearings will increase greatly. Therefore, the so-called "supplement" oils containing a additives are recommended. Because of the non-uniformity of fuels, "Supplement 2" oils are usually recommended by most manufacturers since they are higher additive oils and will take care of fuels containing higher percentages of sulphur.

Naturally, it's always good practice to store lubricating oils properly to avoid any contamination of the lubricants before they are introduced to the lubricating system.

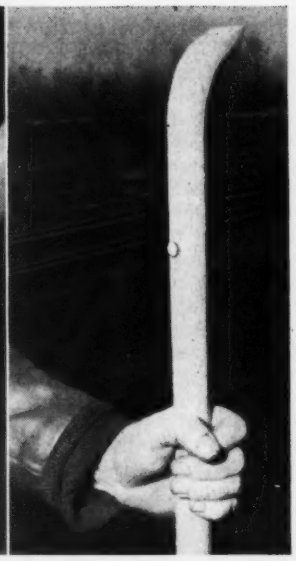
When the tractor actually gets on the job, it is important to be sure that the engine is completely warmed up. The engine should be run at a fairly fast idle so it will warm up in a shorter time. A shorter warm-up period not only saves time but prevents condensation from forming in the crankcase which hastens the contamination of the lubricating oil.

Since the operator is at leisure during the warm-up period, this is the time for him to make a visual

(*Continued on page* 298)

By pulling spikes straight, costly restraightening is avoided, and because the READE SAFETY CLAW BAR can be operated without danger of back injuries to workers, it is doubly economical.

After the pike is loosened and lifted about 2½" with the lower jaws of the tool, the upper jaws are applied for the final complete removal of the spike from the tie, without "heeling".



The safety marker indicates the area of the handle to be gripped so that hand injuries cannot occur by pinching against far rail.

READE TRACK LINER in working position, with holding fin inserted in ballast between ties, and jacking rack against base of rail; carrying handle is at front of jack.

After lining has been completed, lining bar has been removed from position in socket and carrying handle thrown to rear of jack.

With lining bar replaced in socket, operator pulls back on it to take strain off holding pawl; at the same time he steps on carrying handle to trip jack and release pressure on rail.

Jacking rack has returned to original position by spring action, and track liner can now be picked up and moved to next location.

Reduce Track-Work Costs with These Tools

READE SAFETY CLAW BAR Designed to protect workers against injury and to eliminate the high cost of reclaiming damaged and bent spikes. Spikes are pulled straight, without danger of workers' back strains.

READE TRACK LINER Saves up to 50% in time and labor over other methods. No digging of tie ends necessary; track shifts without humping or raising out of cross level. The tool does the heavy work, minimizing chances of strain and personal injury to workers.

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What's the Answer (Cont'd)

inspection looking particularly for oil, water and fuel leaks. He should also check the oil and radiator coolant to see that these fluids are at the proper levels. (Sometimes a slight grease leak will be discovered in the chassis that may be caused by over-lubrication. Such leaks will usually disappear after the moving parts "seat" themselves after the break-in period.)

It's an excellent practice to give the tractor an exercise run after its warm-up. During this "test hop," check controls for proper operation. It's better to dicover malfunctioning controls during a test than on the job when a serious accident might result. If a dozer blade or other equipment is mounted on the tractor, or if the tractor is to work with a scraper, check their controls during the practice run.

When you get the tractor on the job, don't give it "the works" right away. Operate the machine in a gear which will not pull the engine down. An engine turning over at approximately the recommended r.p.m. will run in easily while overloading will build up excessive heat and result in wear.

Manufacturers generally suggest 30 hr. as the period of moderate operation for a crawler. While you might get a little "itchy" to see "just what it will do," control yourself. You'll have opportunity for maximum operation later.

The manufacturers have many good reasons for recommending this 30-hr. period of moderate operation. They know that this amount of time is necessary to give track rollers and chassis assemblies a chance to "seat" themselves and take on a "wear hardening."

When this phase of break-in is completed, speeds and loads can gradually be increased. A good operator will know when his tractor engine is ready to put out its full horsepower.

You may think some of the break-in procedures are a waste of time and are entirely unnecessary. If and when this thought crosses your mind, get rid of it immediately. If you don't, it will cost you money. Sensible treatment of a new tractor and rigid adherence means thousands of low-cost operating hours without major repairs. That's why "loving care and proper feeding" during a break-in period is really a "break" for you.

USE WILLIAMS FORM HARDWARE FOR ECONOMY, SAFETY, AND FAST POURING

SUPER-HI TENSILE INNER RODS CRIMPED TO ACT AS *JACK-TIES* OR PREVENT *TURNING* OR *PULLING*

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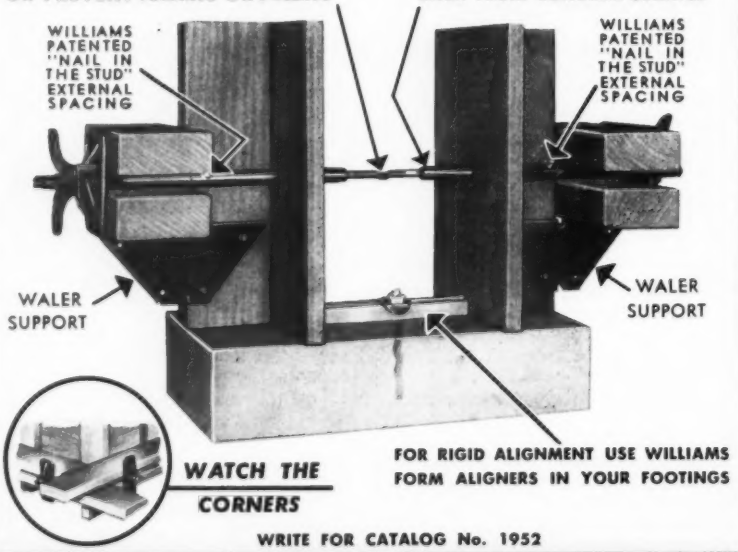
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How to Pre-Test Fuel Oil Tanks

Under what circumstances, if any, is it desirable to test fuel-oil storage tanks before they are put in service? What methods can be used for making such tests? What are the advantages and disadvantages of each? Explain.

Follow A.P.I. Specs

By Kenneth J. Weir

Vice-President, W-M Corporation, Chicago

Fuel oil is a volatile liquid and as such is a potential fire hazard. It is difficult to imagine the circumstances that would make it desirable to place a fuel-oil storage tank in service on railroad property without first having tested it for leakage. Reliable tank fabricators are normally anxious to have suitable tests made prior to acceptance by the customer. In most instances, the specifications of the American Petroleum Institute are probably the best guide to follow.

Shop fabricated tanks of small capacities can be readily tested prior to shipment with the facilities available in any first-class shop. This is normally done with water or air under pressure and any leaks detected are corrected prior to shipment.

Field-erected tanks present a different problem and the tests vary with the location and other circumstances which are present. Bottom assemblies for flat-bottom tanks can be tested in three different ways:

(1) The bottom and first ring can be erected on horses, then filled with water and a visual inspection made below to locate leakage. After the test, the bottom is lowered into position and the balance of the shell and roof assembled. This is a costly method which is seldom used.

(2) A tight dam can be built around the circumference of the tank bottom after all welding on the plates has been completed. Air or water under pressure can then be introduced beneath the plates and the seams inspected for leaks from the upper side of the plates.

(3) Probably the most popular, least costly, and successful testing is that procedure known as the "vacuum" method. In this instance a glass-topped, open-bottom, air-tight box about 2 ft. long, with the bottom edges covered with soft rubber, is placed over a portion of a welded seam, to which a liberal dose of soapsuds has been applied. A small air pump, connected to the box, then introduces a vacuum inside the box and if leakage is

present it can readily be determined through visual observation through the glass top.

After the shell plates have been erected and the tank is ready for a final test, the best results can be obtained by filling the tank with water. This method, in addition to providing a visual leakage test, provides a structural test slightly greater than the tank will be subjected to when filled with fuel oil, which is lighter than water. However, the water testing method is not always practicable because of the cost or shortage of water in the locality.

When water testing is not followed, the seams of the shell plates can be liberally painted on one side with a fine penetrating oil. Seepage through a leak in the weld can then be observed on the other side of the shell plate.

Test Bottom with Vacuum Box

By I. E. Boberg

Chief Engineer,
Chicago Bridge & Iron Co., Chicago

It is our belief that every tank should be tested before being placed in service. In the case of an American Petroleum Institute standard above-ground storage tank, the bottom seams are customarily tested with a vacuum box and soapsuds. The shell is tested by means of filling the tank to the top with water.

We believe that both of these tests should be performed in the interest of knowing that one has a leak-proof tank as well as a structurally adequate tank before any oil is pumped in.

A.P.I. Standards 12C require that, in addition, the roof shall be tested for tightness. The test may be performed either with a vacuum box and soap-suds, as in the case of the bottom, or by means of internal pressure. The owner who uses internal pressure should be very careful not to exceed the strength values which are very low in the case of most roofs. The A.P.I. specifies that such internal pressure shall in no case exceed 3 in. of water.

Obviously, from the standpoint of tightness and demonstration of strength, the test of the roof is less important than the test of the bottom and shell.

All Tanks Should Be Tested

By A. B. Pierce

Engineer Water Supply (Retired),
Southern, Washington, D.C.

From my experience in constructing both horizontal and large or small vertical fuel-oil storage tanks, I strongly recommend that they always be tested before they are put in service. I do not think there are any circumstances that would change this recommendation.

Should a vertical tank with a capacity of from 30 to 1,000,000 gal. be found to leak, it might be necessary, because of the danger of explosion or fire, to empty the tank to weld it. No reputable firm would attempt to repair a tank containing oil or oil vapors without completely emptying the tank and freeing it of all oil vapors. Before entering oil tanks to be repaired, the air in them is actually tested for oil fumes with all manholes open.

The bottoms of all vertical tanks should be tested in the presence of railroad representatives before the roof is installed and after at least the lowest shell sheet has been attached, in accordance with paragraphs 94 and 95 of the American petroleum Institute (A.P.I.) Specification No. 12c (August 1946). This should be done by applying air pressure, or a vacuum, to the joints and using soap suds, linseed oil, or other suitable material, for the detection of leaks in the tank under investigation.

When complete, a tank should be filled with water by the railroad company and thoroughly tested by the manufacturer, under supervision of railroad representatives. The railroad should be ready to fill the tank with water before the manufacturer leaves. Any leaks discovered at that time should be made tight by the manufacturer. Horizontal tanks should be tested with water before filling with oil. After being tested with water, the tank should be thoroughly dried out and cleaned before being put in service. All tests should be made before painting.

Roadbed Stabilization Methods

What are the relative advantages and disadvantages of pole driving and grouting for stabilizing roadbeds? Is one more suitable under certain conditions than the other? Explain.

Investigate Before Deciding

By W. A. Schubert

Division Engineer,
St. Louis-San Francisco, Chaffee, Mo.

Each method, employing either poles or grout, has its advantages. It is obvious that each location to be corrected should be checked closely. Test holes should be made to determine what caused the soft spots and to decide what corrective method should be used.

One of these methods is pole driving. It is an old and well-tried method of correcting soft spots, but its scope is limited. Where a long dump is composed of unstable material throughout, pole driving is the most effective method of correction, provided the fill is relatively low—not in excess of 20 ft. high. The longest poles usually used are not more than 28 ft. to 32 ft. long, since longer poles would be difficult to get under the hammer of a driver. When poles longer than 20 ft. are used, they should be tied together with scrap rail to give more strength to the stabilization.

On light fills, we are driving old ties with a Hystaway attachment applied to a D-7 bulldozer. In all instances where this has been done, soft track has been corrected. These ties are usually driven on 18-in. centers, whereas poles are normally driven on 3-ft. centers.

Where fills are too high for pole driving, we have stabilized them with good results by pyramiding the fill, doing this work with bulldozers and packing the fill well, since most of the trouble originally was due to insufficient fill and improper slope to take care of the weight thrust against the fill. This added fill, built in various sections from the toe to the top, corrected all trouble.

We have also experimented in stabilizing soft spots on level ground by first using a drill mounted on the rear end of a truck to drill holes into the subgrade, then filling them with sand. This method is similar to those used by other railroads on which poles have been driven, then

extracted and the resulting holes filled with sand to stabilize the road bed. The area where this test was made in 1949 has not given any more trouble. Such an operation would eliminate the expense of a work train and a pile-driver gang, making its cost considerably less.

Grouting has its advantages, and best results can be obtained in cuts where old ties and poles cannot be driven because of rock formations below the ballast. Grouting is also effective where the roadbed is saturated or contains water pockets which are comparatively small and scattered over some disance. Under such conditions, grouting is preferred because it reaches every fissure leading to the cavity and thereby prevents the water pockets from spreading.

On high fills, grouting alone would be insufficient, since it would only correct specific spots whereas the fill would still not be uniform throughout nor have adequate width at all levels. No doubt other locations in the same fill would become troublesome in due time.

Grouting is more economical than pole driving primarily because of the high cost of wages and work train services required to drive poles. However, to obtain the best results, high first costs can often be justified. Driving of old ties with a Hystaway attachment on an off-track tractor is the cheapest operation where this type of work will stabilize the roadbed.

Each Method Has a Place

By George S. Crites

Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

Unstable roadbed comes from saturation, water pockets, slips, or slides, all of which are due largely to trapped or seeping water. Where such water can not be economically intercepted and drained away from the roadbed, it is found that, in some locations, water pockets can be replaced with grout and some soils can be made quite stable with grout cementing. In other locations, weak foundations can be strengthened and held in place by driving short or long timbers or poles, piles, or scrap rails, into the roadbed adjacent to the track structure to gain stability.

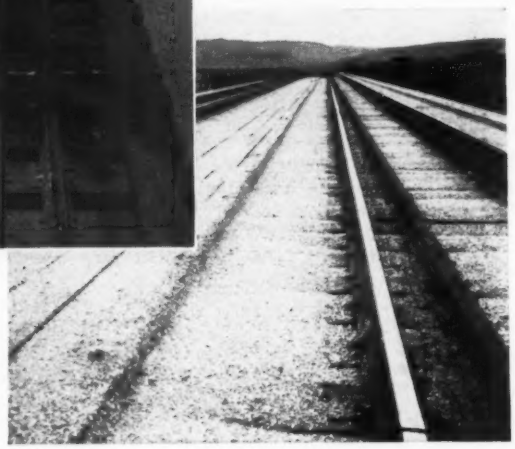
Grouting is resorted to in long and comparatively level stretches where there are little or no means of draining the roadbed and keeping it dry. Bad places may occur in cuts and on fills. The grout crowds the water from the track area and may form a more or less stable foundation material. This action is quite effective in cuts where the masses of grouted materials are held reasonably in place, but on fills, other than where pockets or troughs lay rather uniformly level, the grouted materials may move about and eventually worsen conditions by causing abrupt rather than gradual changes in line and surface.

For grouting, a rather large and expensive setup is necessary which does not adapt itself to taking care of isolated bad places. These iso-

IT COSTS LESS

to protect bridge ties than to replace them . . .

The photo to the left shows the ease with which the Libbey-ZONE Process permits application to any wood surface. Application is made by spray or brush. No skilled labor needed.



The right photo shows a completed Libbey-ZONE application to a typical wood trestle. The white surface is simple, inexpensive gravel aggregate held in place by the Libbey-ZONE coating. Practically fireproof.

Libbey-ZONE Process Reduces Tie Deterioration and Bridge Fire Hazard

You won't deny that replacing weather-worn bridge ties is costly and difficult. Libbey-ZONE process-treated bridge and trestle ties remain in service years longer than untreated ties . . . in fact, almost indefinitely. The carefully compounded asphalt-asbestos Libbey-ZONE coating is applied easily by unskilled hands . . . and immediately seals cracks, crevices and provides a weather-proof coating for the wood surface. To this is added a gravel aggregate that time-proved tests prove highly resistant to fires caused by live coals, fuzees, oil sparks, etc. For your vertical wood bridge supports, The ZONE Co. has developed new ZONE FIREPLATE . . . assuring remarkable resistance to damage from grass or prairie fires. The Libbey-ZONE Process is your road's surest and lowest cost insurance against bridge tie deterioration and the ever present fire hazard to untreated wood surfaces. We invite your inquiry . . . the facts and the proof are yours without obligation.

THE ZONE COMPANY

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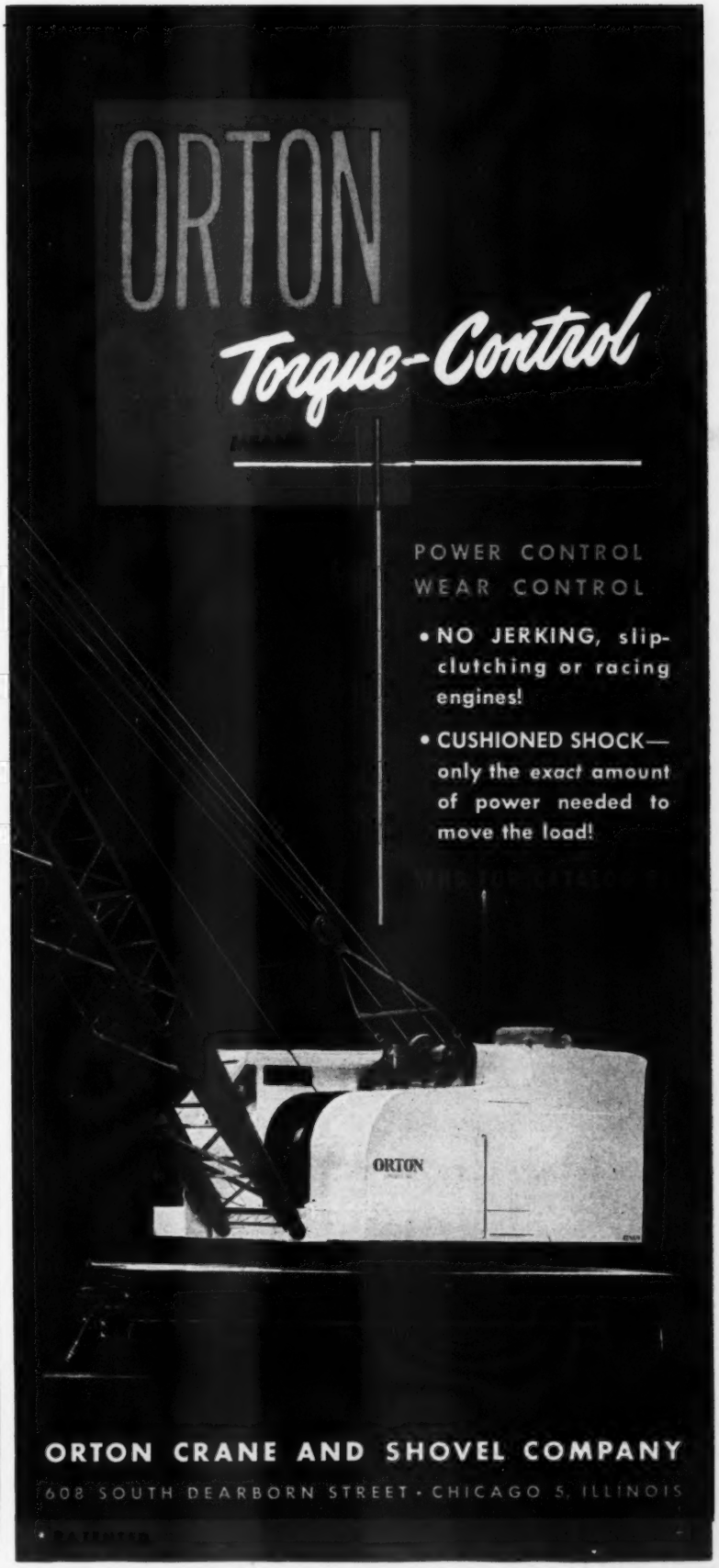
lated places may cause the greater trouble simply on account of their location. If such locations can not be taken care of by proper drainage, it may be that the driving of poles, piles or old rails will contain and hold the unstable foundation materials.

Where the underlying strata is solid but sloping, it is found that old rails, chisel pointed with the base as the cutting edge, driven a short distance into a solid stratum, provides good and lasting support. If such rails are driven too far into a rock stratum, that stratum may be cracked and its holding power weakened. The rails may or may not be waled, depending upon the character of the penetrated materials. Grouting such locations does no appreciable good as the grouted materials tend to slip along with the roadbed.

Where the underlying strata is soft enough to allow it to be penetrated by poles or piles, a good job can be done with them. Usually, waling timbers are needed with poles or piles. Here again, grouting will do no good and may do harm.

Short stretches of unstable roadbed in cuts which can not be drained can be made reasonably stable by driving short pieces of timber, such as old treated ties, within the roadbed area just outside the ends of the track ties. Other than for isolated locations, grout is the most economical stabilizing agent which can be employed in cuts.

Generally, for each location where the roadbed calls for stabilization, a careful study must be made to find all conditions that might cause the trouble. In some places the ground water runs in one direction and the surface water runs in another. High fills may consist wholly of a heterogeneous mass of water pockets separated by diaphragms of clay. Pole driving may be the answer. Grouting may help. Perhaps a trestle, bridge or a line change would be economical in the long run.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THE MONTH'S NEWS...

. . . among railway men—the associations—the suppliers

Changes in Railway Personnel

General

M. I. Dunn, assistant general manager of the Chesapeake district of the Chesapeake & Ohio, with headquarters at Richmond, Va., and an engineer by training and experience, has been appointed assistant vice-president—construction and maintenance—system, at Huntington, W. Va.

William H. Moore, trainmaster on the Southern at Asheville, N. C., and an engineer by training and experience, has been appointed superintendent of the Charleston division at Charleston, S. C. **Donald H. MacLeod,** supervisor of track at Asheville, has been appointed assistant trainmaster at Knoxville, Tenn.

Mr. Moore was born on May 8, 1916, at Hazard, Ky., and was graduated from Virginia Military Institute in 1937. He entered the service of the Southern as a student apprentice in February 1941, serving later as supervisor of work equipment at Charlotte, N. C. In March 1946 he was appointed assistant division engineer at Atlanta, Ga., and later that year he was named trainmaster there, transferring to Asheville in September 1948.

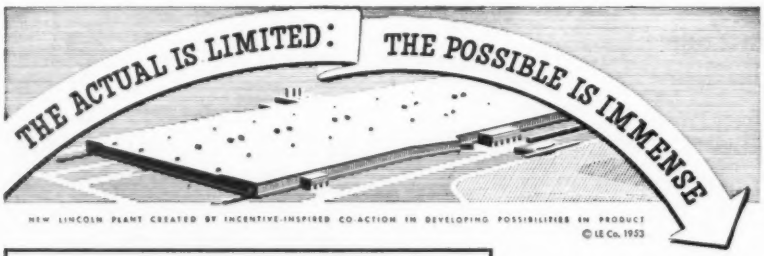
William H. Moore

Engineering

Melvin W. Bruns has been appointed bridge engineer of the Terminal Railroad Association of St. Louis succeeding **L. T. Casson,** resigned.

John P. Hiltz, Jr., who has been appointed chief engineer maintenance of way of the New York Central System, with headquarters at New York (RT&S, February, p. 166), was born at Baltimore, Md., on September 8, 1911, attended Baltimore Polytechnic Institute and Carnegie Institute of Technology, receiving his B.S. in civil engineering degree from the latter in 1934. Entering railroad service with the Pennsylvania on June 15, 1934, as an assistant on the engineer corps, he subsequently served that road as assistant in the office of the comptroller and in the real estate department, as as-

John P. Hiltz, Jr.


THE ACTUAL IS LIMITED: THE POSSIBLE IS IMMENSE
NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT
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On the Right-Of-Way. *Higher quality weld structure . . . less crack sensitivity with "Maganaweld C" assures maximum life at low end-of-service cost.*

WELD metal of Lincoln "Manganweld C" is of uniform, top quality thoroughly tested by the A. R. E. A. and individual railroads. "Manganweld's" high manganese—molybdenum — copper alloy deposits have resistance to abrasion and impact equal to heat treated cast manganese steel. Deposits have greater freedom from cracks and better weld structure than produced by other electrodes. The weld metal is deposited faster . . . with greater ease. Less spatter and less arc blow speed rail repairs and cut costs.

LINCOLN "MANGANWELD C" . . . SPEEDS REPAIRS . . . CUTS COSTLY MANHOURS

Simplifies Build Up *of rail crossing. Hardsurfacing deposits are hand peened after welding, then ground flush.*

SIMPLIFIES MAINTENANCE

LATEST DATA on complete line of Lincoln hardsurfacing electrodes is found in Bulletin 466. For further information about arc welding procedures and equipment write The Lincoln Electric Railway Sales Co., 11 Public Square, Cleveland 13, Ohio. Railroad representatives of

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sistant supervisor of track, and supervisor of track of the Long Island at Jamaica, N. Y. In March 1945 Mr. Hiltz went with the Lackawanna as engineer of track at Scranton, and in March 1948 was named engineer maintenance of way, which position he held until his recent appointment.

C. B. Bronson, maintenance-of-way assistant to the vice-president of the New York Central System, has been promoted to the newly created position of assistant chief engineer maintenance of way, with headquarters as before at New York. The position of maintenance of way assistant to the vice president has been abolished.

G. T. Donahue, district engineer (West of Buffalo), with headquarters at Cleveland, has been appointed engineer maintenance of way, with the same headquarters, and **R. R. Smith,** assistant district engineer, becomes assistant engineer maintenance of way at Cleveland.

E. H. McGovern, district engineer (Big Four), with headquarters at Cincinnati, Ohio, has been appointed engineer maintenance of way at that point, and **A. A. Keever,** assistant district engineer, becomes assistant engineer maintenance of way.

W. H. Miesse, district engineer (Michigan Central), with headquarters at Detroit, Mich., has been appointed engineer maintenance of way at that point, and **J. R. Scofield,** assistant district engineer, has been appointed assistant engineer maintenance of way.

The positions of engineer maintenance of way and assistant engineer maintenance of way at Cleveland, Cincinnati and Detroit are newly created. The positions of district engineer and assistant district engineer at those points have been abolished.

Mr. Bronson was born January 30, 1889, at Akron, Ohio, and received his higher education from the Illinois Institute of Technology. He entered the service of the New York Central in June 1913 as assistant to consulting engineer on rails, ties and structural steel, and in August 1924 was appointed assistant inspecting engineer. He was promoted to inspecting engineer in 1934, and in August 1948 was named assistant engineer maintenance of way. He was promoted to maintenance of way assistant to the vice-president, operation and maintenance, on January 1, 1949, and held that position at the time of his recent promotion on February 1, 1953.

C. B. Bronson

Paul G. Martin, division engineer on the Union Pacific at Los Angeles, has been transferred to Kansas City, Mo., succeeding **R. M. Jolley,** who has retired.

John B. Mitchell, valuation engineer on the Great Northern at St. Paul, Minn., retired recently after 42 years of railroad service. He is succeeded by **Carlton F. Olson,** assistant valuation engineer.

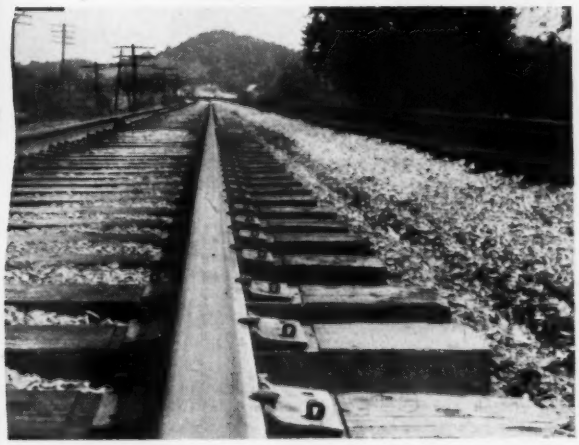
A. J. Strobel, who was recently promoted to division engineer of the Casper & Sheridan division of the Chicago, Burlington & Quincy (RT&S, February, p. 171), was born December 17, 1910, at Fairbury, Neb. Upon graduation from the University of Nebraska in 1937, he entered the service of the Burlington as a rodman. Later that same year he was promoted to instrumentman, which position he held until 1941 when he entered the service of the U. S. Army. Upon release from the service in 1946, he was appointed instrumentman at Casper, Wyo., and the following year was promoted to engineer-inspector at Boysen, Wyo. Mr. Strobel served as assistant engineer of construction on the road's Centennial Cut-Off from February 1, 1948, until January 1, 1953. He received his recent promotion on the latter date.

(*Please turn to page* 304)

Actual size

USE TIE PLATE LOCK SPIKES

for Minimum Annual Cost of Ties in Track



• hold gage • prolong life of ties

• save maintenance expense

LOCK SPIKES hold tie plates firmly in place on cross-ties and bridge timbers. They are quickly and easily driven, or removed, with standard track tools. Driven to refusal, the spread shank is compressed by the walls of the hole. Tie plates are held against horizontal and vertical movement under spring pressure. Play between the spike and the hole is eliminated—gage is held and plate cutting is overcome.

LOCK SPIKES not only become integral with the tie plate, but also the lateral pressure by the legs against the sides of the tie hole, binds the spike in the tie. This unique feature gives tight adhesion between tie and plate.

LOCK SPIKES were first installed in 1947. Since they have been in track, no maintenance whatever has been required. Cost of installing in track is low and comparable to cut spikes. The advantages and saving only found in Lock Spikes reduces the annual cost of ties in track and maintenance expense to a minimum. We invite your investigation.

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Railway Personnel (Cont'd)

Richard E. Sampson, who has been promoted to assistant division engineer on the Boston & Maine at Concord, N. H., (RT&S, January, p. 70) was born at Concord on January 17, 1906, and was graduated from Tufts College with the degree of B.S. in chemical engineering in 1928. Entering the service of the B&M in June 1928 as a rodman at Greenfield, Mass., he subsequently held the positions of general welding foreman and supervisor of welding at Boston, Mass. In June 1943 Mr. Sampson entered the army in which he served with the 720th Railway Operating Battalion until June 1946, when he returned to the B&M as assistant supervisor of track at Dover, N. H. In July 1947 he was transferred in the latter capacity to Greenfield, Mass., and in April 1948 was promoted to supervisor of track at that location, where he remained until he received his recent appointment.

Robert F. Bush, inspector maintenance of way on the Delaware, Lackawanna & Western at Scranton, Pa., has been promoted to engineer maintenance of way, and **B. L. Beier,** division engineer at Scranton, has been appointed engineer maintenance of structures. Both these men, whose headquarters will be at Scranton, have assumed duties formerly performed by **J. P. Hiltz, Jr.,** engineer maintenance of way, who, as announced in these columns, last month, has been appointed chief engineer maintenance of way of the New York Central System. **J. H. Schoonover,** assistant engineer at Scranton, has been appointed division engineer to succeed Mr. Beier, and **James A. Pollard,** roadmaster, has been appointed assistant to engineer maintenance of way, with headquarters as before at Hoboken, N. J.

Clifford T. Gunsallus has been promoted to assistant chief engineer, Eastern lines, of the New York Central, with headquarters at New York.

He was born December 6, 1899, at Beech Creek, Pa., graduated in civil engineering from Pennsylvania State College in 1924 and entered railroad service in June of that year with the engineering corps of the NYC, where he served until November 1927. From the latter date until June 1936, Mr. Gunsallus served as assistant supervisor of track at Watertown, N. Y., Newburgh and Beacon, successively, then becoming supervisor of track at Richland, N. Y., and Beacon, successively. He was appointed division engineer at Watertown in June 1943. On January 1, 1947, he was made district engineer of the Boston & Albany (part of the NYC System) at Boston, which position he was holding at the time of his recent appointment.

Clifford T. Gunsallus

Fred D. Danford, assistant to the chief engineer of the Texas & Pacific at Dallas, Tex., retired recently after nearly 44 years of railroad service. He entered railroad service as a draftsman with the Chicago, Burlington & Quincy in 1909, and in 1912 joined the T&P. He was promoted to inspector of bridges in 1915 and, in May of the following year was promoted to office engineer. He was appointed assistant to the chief engineer in 1945, which position he held until his retirement.

F. A. Williams, assistant division engineer on the New York Central at New York, has been transferred to the Syracuse division at Syracuse, N. Y., to succeed **J. V. Middleton,** who has been promoted to division engineer on the Pennsylvania division at Jersey Shore, Pa.

(Please turn to page 306)

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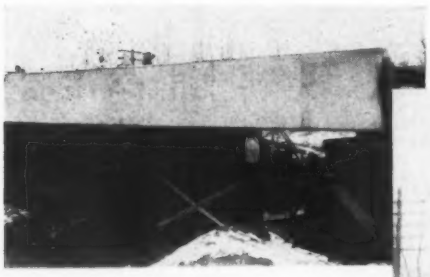
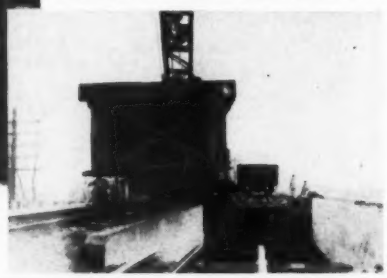


New Span ready to roll in



Old structure being removed preparatory to rolling in new bridge (at right)

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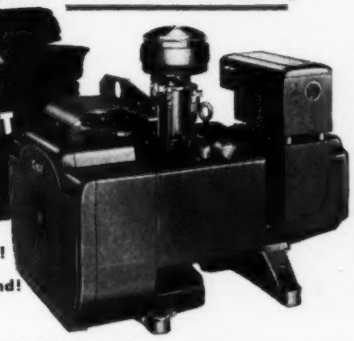

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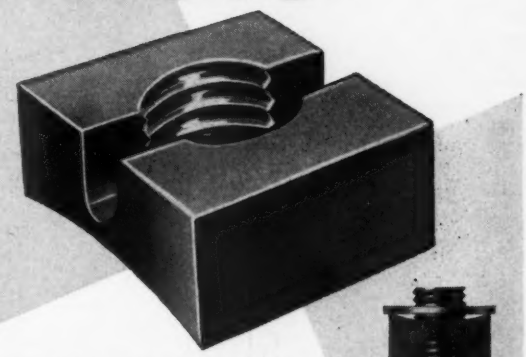

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Railway Personnel (Cont'd)

E. H. Barnhart, division engineer of the Chicago division of the Baltimore & Ohio at Garrett, Ind., retired recently after nearly 46 years of service (RT&S, February, p. 166). Born January 3, 1884, at Sheperdstown, W. Va., he received his higher education from West Virginia University, from which he graduated in June 1906. He entered railroad service July 1, 1906, with the Pennsylvania at Logansport, Ind., and on March 1 of the following year joined the B&O at New Castle, Pa., as an engineer in the maintenance-of-way department. He was transferred to Pittsburgh, Pa., in 1909, and the following year was promoted to assistant division engineer at New Castle. Two and a half years later he was transferred to the Baltimore division and on February 1, 1916, was promoted to division engineer at Parkersburg, W. Va. Later that same year he was transferred to Wheeling, W. Va. On July 1, 1917, Mr. Barnhart was returned to Baltimore where he was engaged in general office work until June 1932 when he was appointed assistant division engineer at Dayton, Ohio. He subsequently served as assistant division engineer and division engineer at Toledo, Ohio, and on May 1, 1940, he was appointed general bridge inspector for the Western lines at Cincinnati, Ohio. He was later appointed division engineer at Garrett—the position he held at the time of his retirement. Mr. Barnhart is a life member of the American Railway Engineering Association and served as president of the American Railway Bridge and Building Association in 1948.

James E. Wiggins, Jr., who has been promoted to engineer of water supply of the Southern at Washington, D. C. (RT&S, February, p. 168), to succeed **Arthur B. Pierce,** who has retired (RT&S, January, p. 70), was born at Garnett, S. C., on December 25, 1902, and was graduated from Clemson College with the degree of B.S. in civil engineering in 1924. In February 1926 he entered the employe of the Southern as a transitman in the engineering department at Charlotte, N. C. After serving at Danville, Va., Mr. Wiggins returned to Charlotte as a junior engineer in June 1937. Later that year he was appointed assistant engineer and in August 1946 was promoted to assistant engineer of water supply at Washington, in which capacity he served until his recent promotion.

James E. Wiggins, Jr.

Arthur B. Pierce

Mr. Pierce was born at Washington, D. C., on December 3, 1882, and entered railroad service in 1902 as an architectural draftsman with the Southern. In 1916 he became track engineer and later that year was appointed engineer of water supply of the system, which position he held until his retirement.

(*Please turn to page* 308)

• The Atchison, Topeka and Santa Fe knew that they had a bad termite and rot problem in many installations in Southern California. They decided to rely on "Wolmanized"* lumber in this badly infested termite area. After 12 years of service, results have borne out their confidence in "Wolmanized" lumber for stations like the one above in Pomona, California.

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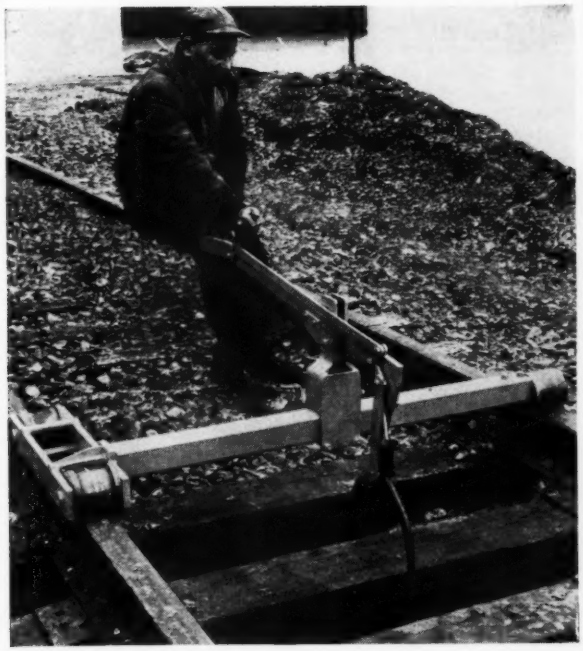

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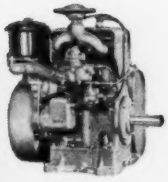
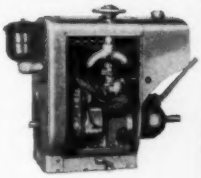
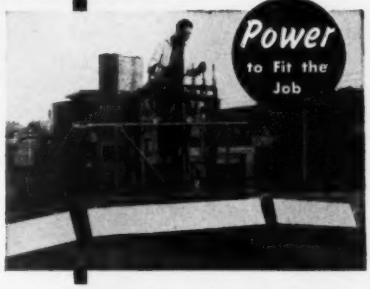


Model TF 4-cycle 2-cylinder standard engine.



Model TF 4-cycle 2-cylinder complete Power Unit, with side panels removed.



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Railway Personnel (Cont'd)

James F. Zanolio, division engineer on the Denver & Rio Grande Western at Salt Lake City, Utah, has been appointed to the newly created position of valuation engineer at Denver, Colo. **A. C. Black,** supervisor of structures on the Grand Junction division, succeeds Mr. Zanolio as division engineer at Salt Lake City.

A. B. Lewis, supervisor of track on the Panhandle division of the Pennsylvania at Steubenville, Ohio, has been appointed assistant engineer in the office of the chief engineer, maintenance of way, of the Central region at Pittsburgh, Pa. **W. P. Hendrix,** design engineer of the Central region, has been appointed assistant engineer in the office of the chief engineer, maintenance of way, of the Western region at Chicago, succeeding the late **J. W. Reed.**

John T. Hoelzer, division engineer on the Baltimore & Ohio at Cincinnati, Ohio, has been promoted to engineer maintenance of way of the Central region with headquarters at Pittsburgh, Pa., to succeed the late **H. H. Harsh. Clarence E. Jackman,** division engineer at Newark, Ohio, has been transferred to Cincinnati to replace Mr. Hoelzer, and **J. T. Collison,** assistant division engineer at Newark, has been promoted to division engineer there to succeed Mr. Jackman.

Walker Paul, whose retirement as assistant to the chief engineer of the Southern Pacific at San Francisco was recently announced (RT&S, February, p. 168), was born September 14, 1891, at San Francisco, and received his higher education at the University of California and the University of Utah. He entered railroad service with the Southern Pacific as an assistant engineer and appraiser in the valuation department on July 18, 1922. In 1940 he was promoted to executive assistant and in 1945 was named assistant to the chief engineer—the position he held at the time of his recent retirement.

M. P. Anderson, office engineer on the Monon at Lafayette, Ind., has been promoted to assistant chief engineer at the same location. **C. M. Bowman,** assistant engineer at Lafayette, has been promoted to engineer maintenance of way. Mr. Bowman will also retain his headquarters at Lafayette.

Frederick W. Hutchinson, assistant engineer maintenance of way of the Central Vermont, has been promoted to chief engineer with headquarters as before at St. Albans, Vt., to succeed **James C. Boyle,** who has retired (RT&S, February, p. 166). **Richard S. Sabins,** roadmaster and supervisor of welding, has succeeded Mr. Hutchinson as assistant engineer maintenance of way, and **Dwight G. Briggs,** district supervisor of track and bridges and buildings at St. Albans, has been appointed office engineer.

Mr. Hutchinson was born at Enosburg Falls, Vt., on September 3, 1910, and was graduated from Norwich University in civil engineering in 1932. He entered the employ of the CV on January 1, 1936, as a transitman, following three years service with the Vermont State Highway Department, and was promoted to assistant engineer on June 1, 1939. On March 8, 1941, he was called to active army service as a first lieutenant. Upon his discharge from the army as a lieutenant colonel serving as executive officer of a heavy bomber squadron in England, Mr. Hutchinson returned to the CV on October 16, 1945, as office engineer, and on

Frederick W. Hutchinson

May 16, 1949, was appointed assistant engineer maintenance of way.

Mr. Boyle was born at Newton, Mo., 66 years ago and entered the service of the CV on February 11, 1916, as office engineer. In 1924 he was promoted to assistant engineer of track and on March 1, 1927, was named engineer of track. He became assistant engineer on August 1, 1937, assistant chief engineer on May 16, 1949, and chief engineer on July 20, 1951.

Mr. Sabins entered the service of the CV on November 22, 1922, as a locomo-

Richard S. Sabins

tive fireman and became track machine operator, engineering department, on February 1, 1926. He was named welding foreman on April 22, 1935; supervisor of welding and equipment on April 1, 1941; general foreman, maintenance of way, on April 15, 1944, and supervisor of equipment and welding on April 1, 1948. He

had held the position of roadmaster and supervisor of welding since May 16, 1949.

Clark M. McVay, consulting engineer of the New York Central at Cleveland, Ohio, and a prominent figure in the early development of eastern Ohio and West Virginia coal fields, has retired after more than 47 years of service.

H. R. Peterson, assistant chief engineer, Northern Pacific, has been promoted to Chief engineer, effective March 1, with headquarters as before at St. Paul, Minn., to succeed **Bernard Blum** who has retired. **D. H. Shoemaker,** district engineer at St. Paul, has been promoted to assistant chief engineer, to succeed Mr. Peterson. **W. R. Bjorklund,** principal assistant engineer, becomes district engineer to replace Mr. Shoemaker, and is in turn succeeded by **J. A. Young,** office engineer. **J. D. Worthing,** assistant district engineer at St. Paul, becomes office engineer to replace Mr. Young. **R. G. Brohaugh,** assistant engineer at St. Paul, has been appointed division engineer at Glendive, Mont., to succeed **J. W. Bolstad,** who has been promoted to assistant district engineer at St. Paul to replace Mr. Worthing.

L. L. Shirey, assistant bridge engineer on the Chesapeake & Ohio, has been promoted to bridge engineer of the Chesapeake district, with headquarters as before at Richmond, Va. **F. B. Manning,** acting engineer of bridges and structures, has been appointed engineer of bridges and structures of the Pere Marquette district, with headquarters as before at Detroit, Mich. **R. T. Guest,** acting division engineer on the Detroit Terminal and Canadian division, Pere Marquette district, has been appointed division engineer of that division with headquarters, as before, at Detroit.

F. H. McKenney, who was recently promoted to engineer of track for the Burlington Lines (RT&S, February, p. 171), was born in 1896 at Lincoln, Neb. He graduated from the University of Nebraska in 1920 and immediately entered the service of the Chicago, Burlington & Quincy as an instrumentman on division and location work. In 1923 he was appointed resident engineer on construction and from 1926 until 1930 held various positions in the office of the chief engineer at Chicago. He was promoted to division engineer in the latter year, which position he held until 1934 when he took over supervision of detector-car operation. Mr. McKenney was promoted to district engineer maintenance of way, Lines West, with headquarters at Omaha, Neb., in 1939—the position he held prior to his recent promotion to engineer of track.

John M. Nicholson, who has been promoted to chief engineer of the Long Island at Jamaica, N. Y. (RT&S, February, p. 168), was born in New York City on September 26, 1881, and was graduated from Columbia University in civil engineering in 1903. In October of that year he entered the service of the Long Island

(*Continued on page* 310)

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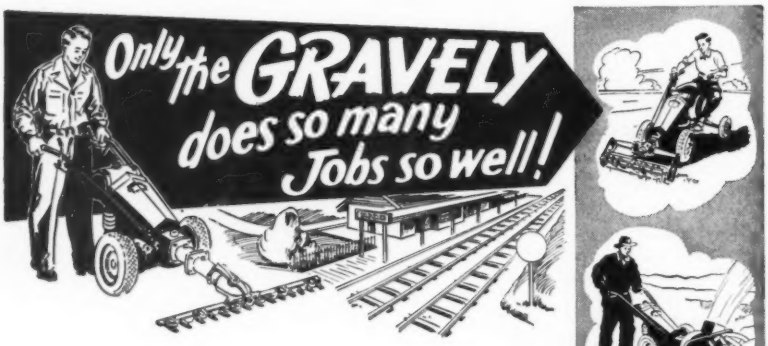

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Railway Personnel (Cont'd)

as a draftsman, advancing to assistant engineer in June 1905. Mr. Nicholson was appointed assistant engineer of the Pennsylvania in October 1928, and assistant to chief engineer of the Pennsylvania's New

John M. Nicholson

York zone in November 1939. In 1949 he was named assistant chief engineer of the Long Island, in which capacity he served until his recent promotion.

Track

J. A. George, roadmaster on the Hamlet-Atlanta line of the Seaboard Air Line with headquarters at Monroe, N. C., has been transferred to the Tampa-Waldo line at Williston, Fla., to replace **R. G. Weaver,** who has been transferred to Monroe to succeed Mr. George.

M. A. Dolcie, acting supervisor of track on subdivision No. 1 of the New York Central at Dunkirk, N. Y., has been permanently appointed to that position to succeed **W. A. Smith,** who has retired. **L. E. Grogan,** acting supervisor of track on subdivision No. 29, Eastern division, at Brewster, N. Y., has been peramanently assigned to that position.

Dale N. Worfel, who has been promoted to supervisor of track on the Lake division of the Pennsylvania at Alliance, Ohio (RT&S, January, p. 74), was born at East Grand Rapids, Mich., on April 28, 1925, and received his Bachelor of Science degree from Michigan State College on June 6, 1948. Entering the employ of the PRR as a junior engineer on July 11, 1948, he held that position, consecutively, at Logansport, Ind., and Columbus, Ohio, until June 1, 1950, when he was appointed assistant supervisor of track on the Philadelphia division at Enola, Pa. On November 1, 1950, Mr. Worfel was transferred to the Middle division at Altoona, Pa., where he remained until he received his recent promotion.

F. R. Huddleston, general foreman on the Southwestern division of the Pennsylvania, has been promoted to acting supervisor on that division at Indianapolis, Ind., succeeding **J. B. Hill. R. D. Baldwin,**

supervisor of track on the Ft. Wayne division at Crestline, Ohio, has been transferred to the Panhandle division at Steubenville, Ohio, replacing **A. B. Lewis** who, as noted elsewhere in these columns, has been appointed assistant engineer, office of chief engineer maintenance of way, of the Central region. **H. E. Richards,** assistant supervisor of track on the Philadelphia division at Harrisburg, Pa., has been promoted to supervisor of track on the Lake division at Ashtabula, Ohio, succeeding **L. E. Ward.** Mr. Ward has been transferred to the Delmarva division at Cape Charles, Va., replacing **W. E. Hiltebeitel** who, in turn, has been transferred to the Ft. Wayne division succeeding Mr. Baldwin. **J. B. Hartranft** has been appointed assistant supervisor of track at Perryville, Md., following his return from military service.

Joseph A. Frost, who has been promoted to supervisor of track on the Erie at Warren, Ohio (RT&S, January, p. 74), was born on March 16, 1907, at Leavittsburg, Ohio, where he entered the employ of the Erie as a trackman on May 1, 1921, while still attending school. He subsequently served, consecutively, as welder helper at Warren; assistant section foreman at Youngstown, Ohio; section foreman at Freedom, Ohio; and extra gang foreman. Appointed acting general foreman on July 27, 1941, Mr. Frost served in that capacity at Youngstown and, later, at Meadville, Pa. On November 1, 1946, he was granted a leave of absence to serve as vice-chairman of the Brotherhood of Maintenance of Way Employes. On April 16, 1948, he returned to the railroad as general foreman at Youngstown, the position he held at the time of his recent promotion.

John H. Hall, supervisor of track on the Southern at Hickory, N. C., has been transferred to Asheville, N. C., to succeed **Donald H. MacLeod,** who, as noted elsewhere in these columns, has been appointed assistant trainmaster at Knoxville, Tenn. **Joe C. Hazelwood,** section foreman at Del Rio, Tenn., has been promoted to assistant supervisor of track at Hickory, N. C., to succeed **Earle W. Carney,** who has been promoted to supervisor of track to succeed Mr. Hall. **Roy P. Taylor, Jr.,** assistant supervisor of track at Greenville, S. C., has been advanced to supervisor of track at Mooresville, S. C. **Claud Koon,** section foreman, has been appointed assistant supervisor of track at McDonough, Ga.; **W. Edgar Johnson,** section foreman, has been appointed assistant supervisor of track with headquarters as before at Charleston, S. C.; **Monrow Lovelace,** foreman on the Charleston division, has been appointed assistant supervisor of track at Shelby, N. C. **Sam M. Sims, Jr.,** who has been serving in various capacities on the Mobile division, has been appointed assistant supervisor of track at Wilton, Ala. Also, the following section foremen on the St. Louis-Louisville division have been promoted to assistant supervisors of track: **Paul J. Trusty,** at Princeton, Ind.; **E. T. Jones,** at East St. Louis, Ill.; **Gus D. Fallis,** at Lawrence-

(*Continued on page* 312)

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Use equal parts of standard portland cement and Chicago Fly Ash in your grouting mix.

You'll be pleased with the results,—a better-flowing more plastic grout using less water, much less heat of hydration, and better penetration of underground voids because premature stiffening of the grout mix is largely prevented.

Chicago Fly Ash is finer in particle size than cement, and spherical in particle shape. Its value in increasing "pumpability" of a grouting slurry, or in reducing the amount of cement needed to achieve a given flow quality in the grout, makes it a desirable ingredient for use in many types of railroad grouting jobs,—for stabilizing roadbeds in cuts and on fills, foundations of old masonry retaining walls, bridge piers and abutments, jacking floors in buildings, and in many other ways.

Chicago Fly Ash is extremely low in cost and immediately available in bags or in bulk.

Note: Mention of the use of fly ash is included in the new specifications, "Roadbed Stabilization by Pressure Grouting" adopted in 1952 by Committee I of the A.R.E.A.

One contractor writes: "This was a most unusual job with the Government Engineers insisting on using a 1-3 cement and sand mix with a low water content and it was almost impossible to pump this grout with the mix specified by them without using a lot of water. After considerable effort we secured permission to use your Chicago Fly Ash. The fly ash solved the problem. We maintained the same amount of water in our mix and were able to pump the grout successfully.

"I might say that this experience has taught us that by using fly ash a multitude of causes of trouble can be eliminated, and you can rest assured that from now on fly ash will be more freely used by our company."

CHICAGO FLY ASH COMPANY
288 North LaSalle Street, Chicago 1, Illinois

BUDA TRACK JACKS

Safe, Dependable... Ruggedly Built...

Buda Track Jacks will give you years of safe, trouble-free, low cost lifting. Made in 6 Models... capacity to 15 tons, each Jack has the fast trip feature that permits fast load drops when required. Write for Bulletin #1515. The Buda Company, Harvey, Illinois.

Model 815—8" Lift

Model 514—5" Lift

Model 135-A (Aluminum Frame) 13" Lift
Model 715

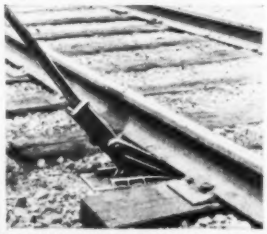
Model 225—A KLINCH-KLAW with Bolt Puller
Total Lift Ins. 22¼"

Model 615—20½" Lift

BUDA TRACK LINERS

FAST, ACCURATE, LOW COST

Three men with Buda Track Liners can align more rail than eleven men with lining bars. Liners don't raise track... no digging required ... liners do not obstruct track. Write for Bulletin on Track Liners.



BR-8

BUDA

Railway Personnel (Cont'd)

burg, Ky.; **Russell W. Meyer,** at Mt. Vernon, Ill.; and **Peerless R. Maxey,** at Huntingburg, Ind.

Water Service

E. M. Kendall has been appointed water service and heating engineer on the Santa Fe at Amarillo, Tex., succeeding **C. B. Clegg,** who has retired after nearly 38 years of service.

Bridge and Building

Verne Lyman, district supervisor on the Central Vermont at Montpelier, Vt., has been promoted to supervisor of bridges and buildings at St. Albans, Vt. Mr. Lyman was born at Orange, Mass., on May 3, 1903, and entered the service of the CV as a chainman in the engineering department on December 17, 1924. He became a transitman on July 10, 1926; assistant engineer on February 11, 1929; and district supervisor at Montpelier on June 1, 1939.

Shirley White, whose promotion to general bridge and building supervisor of the Southern Pacific at San Francisco was recently announced (RT&S, February, p. 168), was born May 17, 1902, at Aurora, W. Va. He entered railroad service on December 3, 1918, as a carpenter helper on the Arizona Eastern, and in March 1920 was promoted to carpenter. He served as assistant bridge and building foreman from 1922 until 1923 when he was named foreman. He served as foreman until December 1924 when he became bridge and building foreman on

Shirley White

the SP's Rio Grande division. From March 1, 1942, until February 28, 1943, he served as assistant bridge and building supervisor and in the latter year was appointed superintendent of dam construction on the Bonita Dam. Mr. White was named general bridge and building foreman on the Rio Grande division in September 1943, and was promoted to senior assistant bridge and building supervisor in February 1947. In August 1948 he was promoted to bridge and building supervisor at Tucson, Ariz.—the position

he held at the time of his recent promotion to general bridge and building supervisor.

Special

Roy B. Chapman, who was recently promoted to general superintendent of maintenance of way shops and equipment on the Southern Pacific at San Francisco (RT&S, February, p. 180), was born October 28, 1887, at Milbury, Ohio. He entered railroad service in 1911 as a signal foreman with the Pennsylvania at Ft. Wayne, Ind., after having been associated with the Union Switch & Signal Co. for six years. He joined the Southern Pacific in March 1912 as signalman and

Roy B. Chapman

foreman at Oakland, Cal., and in January 1918 was promoted to division electrician at that location. In February 1935 he was appointed track welding supervisor for the system, and in November of the same year was promoted to supervisor of work equipment and welding for the system. He was promoted to general supervisor of work equipment and welding in August 1952—the position he held at the time of his recent promotion.

Obituary

H. J. Bogardus, special engineer on the Pere Marquette district of the Chesapeake & Ohio, and former chief engineer of that district, died February 11 at Detroit, Mich.

James L. Rippey, retired assistant chief engineer of the Chicago, Milwaukee, St. Paul & Pacific, died recently at the age of 81. Mr. Rippey, who served the Milwaukee Road for some 25 years, retired in 1943.

H. R. Clarke, whose retirement from the position of chief engineer of the Chicago, Burlington & Quincy and subsidiary lines was announced in the February issue, died February 18. A biographical sketch of Mr. Clarke's career was published on page 171 of the February issue of *Railway Track and Structures.*

(*Please turn to page* 314)

4 "Grates"

For Executives and Engineers Responsible for Engineered Plant Services

KLEMP Metal Gratings

- *Protect against floor wastes*
- *Reinforce all concrete surfaces*
- *Insure fireproof, non-slip footing for men and traffic*
- *Insure efficiency with safety*
- *Insure protection, plus comfort through complete ventilation*

The Klemp Metal Grating Corporation has been serving the needs of those men responsible for the safety of plant employees and the maintenance of all types of flooring for almost half a century. This includes stairways, stair treads, runways, catwalks and tower stairs in industries where there are flooring problems, such as chemical and gas plants, power stations, oil refineries, or where there are turbine rooms and pump rooms. During this time, Klemp has produced and patented several specialized gratings including Hexteel and Floorsteel.

Klemp's engineers have exclusively specialized in the fabrication of gratings such as Hexteel Surface Armor and Floorsteel Flexible Floor Armor for reinforcement of all surfaces where concrete or mastic are applied.

Klemp's diamond riveted and welded gratings are ideal for foot and plant material traffic wherever rugged strength is needed in structural footwalks, stair treads and open steel flooring.

We solicit the opportunity to let Klemp's engineers help solve your most difficult grating problems. Send in your blueprints for quotations today. All types of Klemp Gratings are available for immediate shipment.

We Tread the World with Safety

KLEMP METAL GRATING CORPORATION

SYNTRON

PORTABLE POWER TOOLS

Fill the Needs for Railroad . . .

CONSTRUCTION and MAINTENANCE

Speeds up spike driving.

GASOLINE HAMMER
SPIKE DRIVERS
ROCK DRILLS
and
PAVING BREAKERS

Self - contained Gasoline Hammer Spike Drivers and Rock Drills that deliver over 2000 heavy blows per minute. Easy operation by one man for driving spikes —cutting asphalt—digging clay, shale and frozen ground—tamping backfill.

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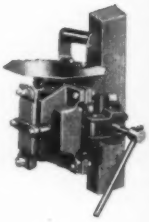
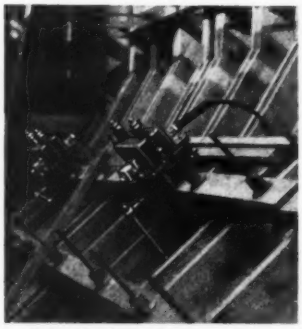
CONCRETE
VIBRATORS

Wall Form Vibrators which assure uniform compacting and settling on light, medium or heavy form work. Motor driven flexible shaft types also available.





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Railroad Crane-mounted 9000 DPH Pile Hammer in operation.

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Syntron Diesel Pile Hammers are entirely self-contained. Extra heavy-duty units that require no auxiliary equipment such as boilers or air compressors.

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Association News

Metropolitan Maintenance Of Way Club

At a dinner meeting of the club, held at the Hotel Shelburne, New York on February 19, the main feature of the evening was an open forum discussion on "What Changes Has Dieselization Caused in Maintenance Work?", which was preceded by four short talks by C. O. Wolfesberger, supervisor of road, Baltimore & Ohio, on "Line and Surface"; R. T. Spaulding, supervisor of track, Boston & Maine, on "Rail Curve Wear and Defects"; N. J. Vito, roadmaster, Delaware, Lackawanna & Western, on "Yards and Switches"; and K. L. Miner, engineer of bridges, New York Central, on "Bridges and Tunnels."

The next meeting of the club will be the annual meeting, with election of officers, to be held at the Hotel Shelburne, on April 30, the program for which will be announced later.

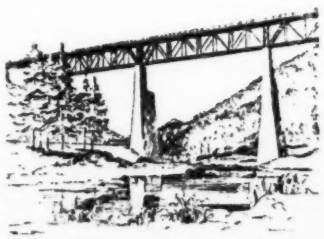
Mississippi Valley Maintenance of Way Club

A total of 217 members and guests attended the meeting that was held at the De Soto Hotel, St. Louis, on February 9. The principal speaker was E. L. Anderson, chief engineer of the St. Louis-San Francisco, who spoke on the subject, "Why Reorganize Track Maintenance of Way Forces." The program also included a showing of the film entitled "The Tehachapi Earthquake," which depicted earthquake damage and rehabilitation on the Southern Pacific in California last summer.

The March meeting was scheduled to be held on the ninth at the Hotel De Soto. The scheduled program consisted of a moving picture taken on the Louisville & Nashville entitled "Fishing a Railroad Out of the Swamp," together with additional film slides and commentary on the subject by L. L. Adams, chief engineer of the L.&N.

At the close of the meeting on February 9 membership in the club totaled 469. The goal is to achieve a membership in excess of 500 before the end of the current season, and the officers of the club are confident that this figure will be reached.

(*Please turn to page* 316)



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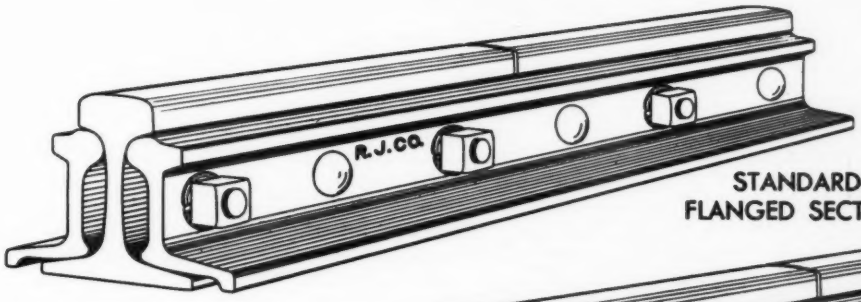
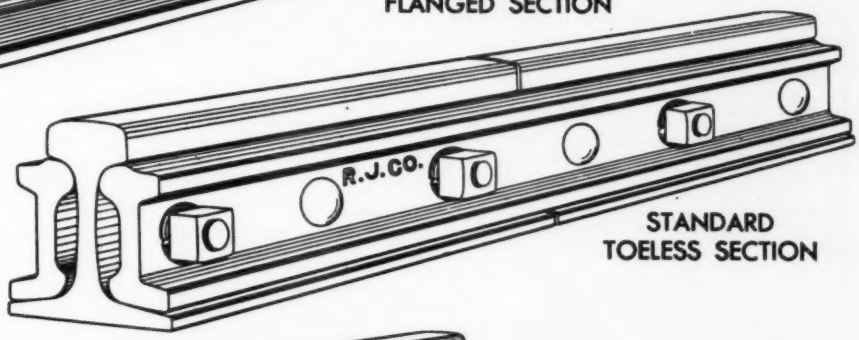
INSURES LONGER RAIL LIFE



STANDARD
FLANGED SECTION



STANDARD
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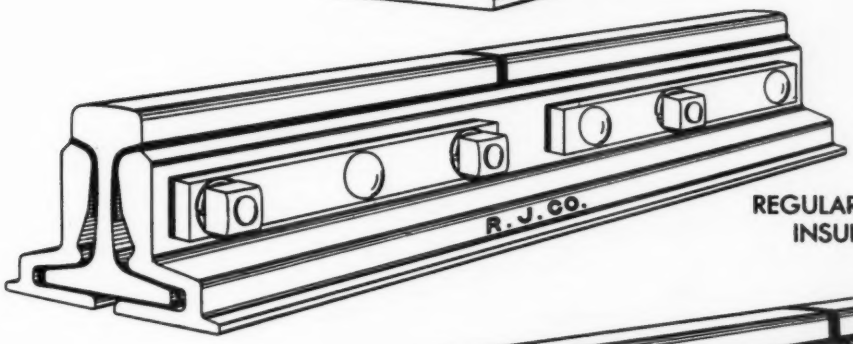
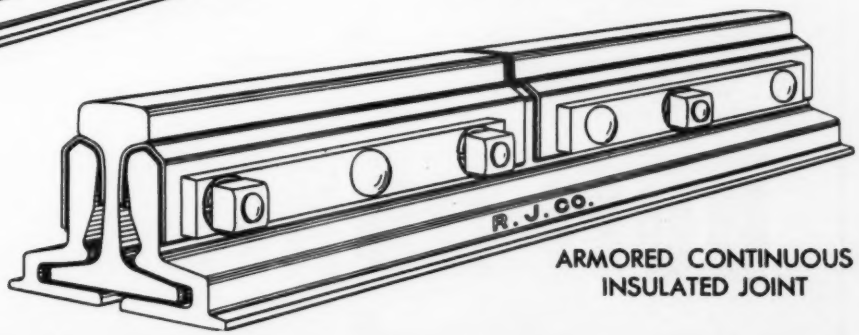


REGULAR CONTINUOUS
INSULATED JOINT



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THE RAIL JOINT COMPANY Inc.
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1.

2.

Why section gangs work faster with these two aluminum track jacks

Ask Tony or Joe or any of the boys who worked with either of these Duff-Norton aluminum track jacks, and you'll get the same story. They like them because they're 25% and 33⅓% lighter than jacks with malleable iron housings. Being lighter in weight they are easier to carry and spot. With less energy expended in handling unnecessary dead weight, the gang is able to do more work.

Write the world's oldest and largest manufacturers of lifting jacks for TRACK JACK Bulletin AD18-F, The Duff-Norton Manufacturing Co., P. O. Box 1889, Pittsburgh 30, Pa. Canadian plant —Toronto 6, Ontario.

1. No. 517BA Single Acting Surfacing Jack can raise 15 tons 5 inches, weighs only 31 lbs.
2. No. 117A Single Acting Track Jack can raise 15 tons 13 inches, weighs only 46 lbs.

DUFF-NORTON Jacks

"Giving Industry A Lift Since 1883"

Association News (Cont'd)

Maintenance of Way Club of Chicago

The February meeting of the Club would normally have been held on the 23rd, but since Washington's birthday was observed on that date, the meeting was postponed until March 2. The principal speaker was J. A. Bunjer, assistant chief engineer of the Union Pacific, who described the 42-mile line change that the UP is now bringing to completion in Wyoming.

To maintain the four-week interval between meetings the March meeting, which normally would have been held on March 23, is scheduled to be held on the 30th.

(*Please turn to page* 318)

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 17-19, 1953, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual meeting, April 28, 1953, Cleveland Hotel, Cleveland, Ohio. W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—Next meeting March 30. E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

Mississippi Valley Maintenance of Way Club—P. E. Odom, Secretary-Treasurer, Room 1008, Frisco Building, 906 Olive Street, St. Louis 1, Mo.

National Railway Appliances Association—J. B. Templeton, Secretary, 1020 So. Central avenue, Chicago 44; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Annual meeting, October 14-16, 1953, Biltmore Hotel, Atlanta, Ga. Roy M. Edmonds, Secretary-treasurer, 1221 Locust Street, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

You too, can reduce track maintenance costs with RACINE PORTABLE TRACK TOOLS

Features that make it easy for you to choose a RACINE portable Rail Saw

- **LABOR SAVING** — One man operation, does the work of several hands. Easily moved by two men — no traffic interference.
- **EFFICIENT** — In or out of track, a Racine Saw cuts fast, smooth and accurate. Cut-off any length down to one-tenth of an inch.
- **MATERIAL SAVINGS** — Shattered and burned rail ends, failures from fractures caused by "nick and break" or torch methods of cropping are substantially reduced.

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RACINE PORTABLE RAIL DRILL
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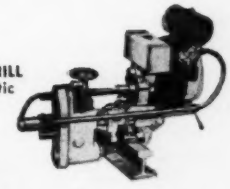

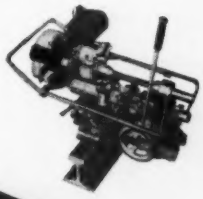

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Twin Spindles — Lever and Rack Feed

WRITE FOR NEW CATALOG **showing Racine's complete line of Rail Tools. Address RACINE HYDRAULICS & MACHINERY, INC., 2038 Albert St., Racine, Wis.**

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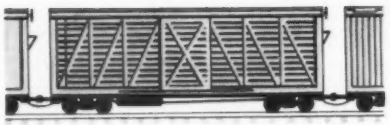
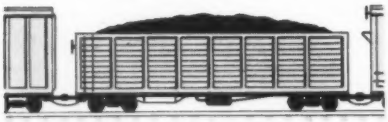
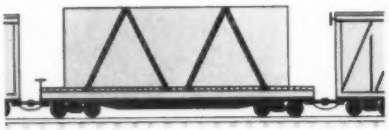


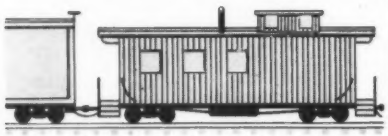
GIVES



CLEAN



PROTECTION



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Conforming to A.W.P.A. Specification P8 and P9

Supply Trade News

General

The **Westinghouse Air Brake Company**, Pittsburgh, Pa., has purchased control of the **Le Roi Company**, Milwaukee, Wis. The latter company, however, will continue to be operated as an independent concern, and there will be no change in the set-up or organization for manufacturing and selling its products, including the Tractair, to the railroad industry. **George M. Hogan & Co.**, Chicago, will continue to serve as national representative in the railroad field for the Le Roi Company.

The Maintenance Equipment Company, Chicago, recently concluded a contract with the **Wood Treating Corporation**, Cleveland, Ohio, as a result of which Maintenance Equipment becomes worldwide distributors of Tylife, a product for increasing the holding power of track spikes.

Personal

Don Call has been appointed Southeastern sales representative for the **Philip Carey Manufacturing Company**, Cincinnati, Ohio. Mr. Call's new title was incorrectly listed as railway sales manager in the February issue.

Hugh Hazelton, Jr., has been appointed assistant to the vice-president in charge of sales of the **Ramapo Ajax Division of the Amercan Brake Shoe Company.** Mr. Hazelton joined the company in 1933 as a buyer in the purchasing department upon graduation from Yale University. He became a sales representative for Ramapo Ajax in 1934, and for the American Brakeblok Division in 1940. In 1946 he moved into the export department. He was appointed a sales representative for the Ramapo Ajax Division in Chicago in 1947, which position he held prior to his recent promotion. He will continue to make his headquarters at Chicago.

Hugh Hazelton, Jr.

H. C. Allington has been elected vice-president in charge of sales of the Eastern division of the **Colorado Fuel & Iron Corp.**, with headquarters at New York. **L. A. Watts** has been named general manager of sales of the Eastern division, also with headquarters at New York.

Mr. Allington, who will supervise all Eastern division sales of CF&I and its subsidiaries, has been general manager of sales of CF&I's Wickwire Spencer Steel division since October 1947. Prior to that time he served as Eastern district manager of the Sharpsville Boiler Works, and sales manager of the Oil Products division of American Machine & Metals, Inc.

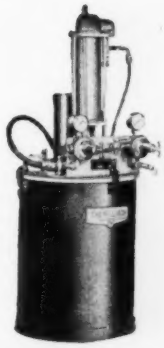
H. C. Allington

A graduate of Northwestern University, Mr. Watts joined the Wickwire Spencer Steel division in 1938 as a chemist at Buffalo, N. Y. He served successively as foreman, assistant superintendent and metallurgist in the wire mill there, and in 1947 was appointed manager of the general wire sales department. He was named district sales manager at Detroit in 1948, and in 1950 established and managed the pig iron and semi-finished sales department of Wickwire Spencer. On January 1, 1951, he was appointed assistant general manager of sales for Wickwire Spencer—the position he held at the time of his recent appointment.

L. A. Watts

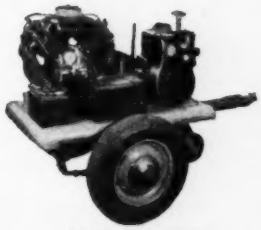
(*Please turn to page* 320)

Spray Guns



Material Tanks and Pumps

Hose and Connections



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Save time, speed painting with

DeVILBISS PORTABLE SPRAY-PAINTING OUTFITS

The efficient, compact, fully portable DeVilbiss maintenance painting outfit shown above is tailor-made to handle the thousands of miscellaneous painting jobs in railroad yards or down the line.

Gasoline-powered, two stage V-type air compressor is easy to start, furnishes ample compressed air. Together with DeVilbiss spray guns, hose and paint tank, this versatile outfit handles any size painting job . . . anywhere. Outfit can be easily attached to auto or truck for fast, easy towing.

This is just one of a complete line of DeVilbiss products designed to help you save time and lower your costs of maintenance painting.

Start saving today! Contact your local DeVilbiss Jobber, our branch office or factory for specific information on DeVilbiss Portable Spray-Painting Outfits, individual spray guns, air compressors, paint tanks or other spray-painting accessories.

Free of charge, DeVilbiss will train your painters and maintenance foremen on all phases of the spray method. Write for application forms and dates of these one-week courses.

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This rugged, all steel, welded frame car features a light weight reversible transmission coupled to a powerful 4-cycle, air cooled engine and chain drive to the rear axle. Built for utility and comfort, too, the car is equipped with a spring suspended seat that reduces operator fatigue. Whatever your car needs, it will pay to . . .

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Factory and General Offices: Eau Claire, Wisconsin, U. S. A.

Supply Trade News (Cont'd)

John A. Shelley has been appointed traffic manager of **Bird & Son, Inc.**, East Walpole, Mass., succeeding **Michael J. Hawkins**, who has retired after 46 years of service.

Fred W. Rusch, who until recently headed sales operations in Brazil for the **Sherwin-Williams Company**, Cleveland, Ohio, has been named assistant manager of the company's Atlantic Coast transportation zone, with headquarters at New York.

Russell E. Legrand has been appointed sales engineer for the **Bogue Railway Equipment Division**, Paterson, N. J. He will cover the Middle West from his headquarters in Chicago.

Harmon A. Sly, formerly Chicago district manager for **Fairmont Railway Motors, Inc.**, has been appointed special Eastern representative of **Racine Hydraulics & Machinery, Inc.**, Railroad division. **A. Milton Wells**, vice-president of the **Achuff Railway Supply Company**, has been appointed manager of the Railroad division, with headquarters at Racine, Wis.

Robert McNeal Smith, manager of sales of the New York district of the **Pittsburgh Screw & Bolt Corp.**, Pittsburgh, Pa., has been promoted to assistant vice-president, sales, of the Eastern area with headquarters at New York. He is succeeded by **Samuel M. Sipe**, sales representative. **Robert B. Algie**, formerly assistant manager of sales of the Jones & Laughlin Steel Corp., and more recently associated with the Forbes Steel Corporation, has been named assistant manager of sales with headquarters at Pittsburgh.

Gilfry Ward has been appointed president and **Joseph L. Mullin** first vice-president of the **American Manganese Steel Division of the American Brake Shoe Company.**

Mr. Ward joined the Amsco division as a trainee in the engineering department upon graduation from Yale University in 1928. In 1932 he transferred to the sales department and in 1937 was appointed a district sales manager. In 1938 he was made vice-president, and in 1948 was placed in charge of sales for the division.

Mr. Mullin, formerly vice-president in charge of operations of the Amsco division, joined the company as a clerk in 1914. He held various jobs in the operating department and in 1928 was appointed general superintendent of foundries for the Amsco division. He was named vice-president in charge of operations in 1945.

Obituary

G. H. Larson, office manager of the Rail Joint Company at Chicago, died suddenly on February 7. Mr. Larson had served the Rail Joint Company for 50 years of which 30 years were spent as office manager at Chicago.

"He Might Need It..."

"He never was much for letter-writing when he was in college. But he must know how anxious Mother and I are . . . now that he's off in Korea. Haven't heard from him in six weeks. Of course, they say 'no news is good news' . . . but I wonder. Maybe he can't write . . . because . . . maybe he's in a hospital somewhere. And maybe he needs blood. I don't know . . . but I'm not taking any chances. That's why *I'm* giving blood."

★ ★ ★

Yes, all kinds of people give blood —for all kinds of reasons. But whatever *your* reason, this you can be sure of: Whether your blood goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM

Business Executives!

✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of cooperation?
- ☐ Was information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

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The Q and C Universal Type Guard Rail Clamps shown have given excellent service for 15 years on 7" rails of a heavy traffic line.

One size of the forged steel yoke is suitable for a range of sections, which simplifies and reduces inventory.

Order now for early delivery.

Other Q and C Products:

Derails, Switch Point Guards, One-Piece Manganese Guard Rails, Step Joints, Wheel Stops, Gauge Rods, Car Replacers, Snow Flangers and Plows, Skid Shoes, Anti-Slip Rail Tongs, Flangeway Brackets, Electric Snow Melters, Gauging Tools, Foot and Heel Guards.

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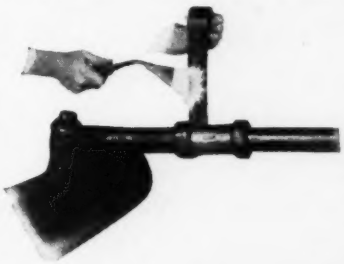
TAPECOAT is the coal tar protection in handy tape form. It comes in widths of 2, 3, 4, and 6 inches for spiral wrapping; and in widths of 18 and 24 inches for cigarette wrapping of large diameter pipe, tanks, etc.



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POLICING UP

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There are many important reasons why this big yellow rig was selected to police the Denver & Rio Grande's main line. The 100-horsepower No. 12 Motor Grader is a talented piece of equipment. It can ditch, reverse blade, bank shape, and even plow snow.

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